



FRIDAY, FEBRUARY 2.

Steam Shovel and Derrick Car.

The accompanying engraving represents a steam shovel which can be converted into a portable crane or derrick, and which is manufactured by the Bucyrus Foundry & Manufacturing Co., of Bucyrus, O. Since the machine illustrated by the engraving was built, that company has improved the construction in a number of points. These improvements we expect to illustrate from detail drawings, in a future number. We therefore reserve the full description until then.

Contributions.

Rapid Tunnel Work.

RICHMOND, Ky., Jan. 27, 1883.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I forward a statement of rapid tunnel work which I think deserves a medal, though some of your subscribers may be able to furnish a record of work equal to it. Will they?

The tunnel is on section 66 of the Kentucky Central Railroad extension, Rockcastle County, Ky., through a spur of hard limestone in 2 ft. and 6 ft. ledges close together and not separated by softer strata. The contractors are Messrs. C. R. Mason & Co. The section manager is Mr. John Canton, and (palman, etc.) the foreman in heading is Mr. G. E. Waugh.

The gang (*non quo, sed quomodo*) is composed of 13 convicts from the Kentucky Penitentiary, who work 9 or 10 hours per diem, Sunday and Christmas Day excepted.

Method, hammer; explosive, Hercules powder. Work recorded was by day shift only, with four hammers, four steel men, five barrowmen, who fired the first blast on Dec. 6. Measurement taken on Jan. 20 shows that the four hammers have driven a circular heading 7 ft. high with 16 ft. floor of 212 lineal feet! Time, 39 days, or 370 hours; content, 3.3 cubic yards per lineal foot. *An average progress of 5.73 ft. for 10 hours' work!* At the other end of the tunnel there is a gang of free labor with a record of 153 lineal feet in 35 days, or 4.37 lineal feet for 10 hours' work—no small performance in itself.

If this record is doubted I will be glad to convince the skeptic by giving him a chance to "see the four hammers." DIVISION ENGINEER.

The Locomotive Tests on the Boston & Albany Railroad.

No. 79 MILK STREET, Boston, Jan. 26, 1883.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The editorial criticism* calls my attention to an omission regarding the method employed in computing the "steam accounted for by indicator diagram." There should have appeared in the report under head of "The data and results," after referring to the Table No. 3, the following statement, one which I usually put into my reports, and one which I supposed was appended to this till the article called my attention to it:

"The amounts giving the 'steam accounted for by indicator diagrams' are computed by the use of the writer's formula

$$\frac{13,750}{m. e. p.} \left[\left(\frac{C}{E} + \frac{W_c}{R} \right) \text{ or } - \left(\frac{W_c}{E} + \frac{W_p}{F} \right) \right]$$

in which *E*, *C*, *R* and *P* are the percentages of clearance, cut off, release and compression respectively; *W_c*, *W_r* and *W_p* the weight of saturated steam per cubic foot at the cut-off pressure, release, pressure and compression pressure respectively, and *m. e. p.* the mean effective pressure."

Will you allow me to say in regard to the criticism that I do not see how the conclusions of the writer of the article can be accepted. I refer to those bearing on the relative performance of the valves and the relative performance under the two pressures.

Whatever the actual difference between the two valves may have been, there can be no doubt expressed in regard to the statements made under head of (1) and (2) in my discussion of results of the performance of the valves. I maintain this because it is a matter only of measurement from the diagrams taken with the instruments. The instruments can be relied upon to show truthful indications, for the reason that the portion of the road on which most of the engine tests were made does not have abrupt changes of grade, and diagrams taken as often as every 2½ minutes give reasonably good average conditions. In the face of the diagrams, which reveal the real action of the valve mechanism, showing only 2 or 2½ per cent. in favor of the Allen valve, how can 7 per cent. be arrived at?

So also in the matter of the different pressures; the record of the diagrams taken alone gives no indication whatever of the old engine being able to equal in performance the new engine if given the "same show."

The careful student will gather from these tests that the consumption of coal in locomotives is very uncertain in quantity under what appear on the surface to be the same conditions. The influences which make this so do not affect the operation of the steam in the cylinders, and questions relating to the use of steam once generated can better be investigated therefore at the cylinder, where the active

agent does its work in its own uniform manner, than at the fire door, surrounded by its unknown vicissitudes.

GEO. H. BARRUS.

[Mr. Barrus' reasoning does not alter the fact that the locomotive which will be preferred by railroad managers, other things being equal, is that which burns the least fuel in doing a given amount of work. That is the final test to which all other tests will be subordinate. It is true that the uses of the indicator may help to show the reason why a locomotive burns much or little coal, although, probably, its usefulness, in this respect, has been much overestimated by some engineers. To the use of the indicator as a means of investigation there is, of course, no objection, excepting that it is doubtful whether as much can be learned from or by its use as many persons think. It is true that the consumption of coal in locomotives is very uncertain, but the very object of making tests like those made on the Boston & Albany Railroad is to show what must be done so that it will be certain that there will be little fuel and not much consumed in doing a given amount of work. The record of the indicator diagrams may, it is true, "reveal the real action of the valve mechanism," but it is not a safe or sure measure of the economy with which the engine is doing its work. If measurement from the diagrams should show that one engine is the most economical, and measurement from the pile of coal should show that another was (and such a discrepancy is quite possible), which engine would a railroad manager be likely to prefer? In point of fact, we doubt whether even intelligent and experienced engineers would agree as to which was the best form of diagram, supposing that the valve mechanism of a locomotive could be so controlled that any form could be made consistent with the physical laws which govern heat and steam.—

EDITOR RAILROAD GAZETTE.]

Wheel Service—Facts versus Assumption.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In the article in your issue of Jan. 12, 1883, on "Steel versus Cast-Iron Wheels" the writer says, first: "As this is a most important matter, both to the railroad companies and the manufacturers of cast-iron wheels," etc. Now I cannot quite comprehend why the railroads are so deeply interested in the manufacturers of cast-iron wheels and not equally interested in the manufacturers of steel-tired wheels, for it must be apparent to any unprejudiced mind that railroad interest is comprised simply in the problem of economy in all mechanical appliances used in their service and not in any particular manufacturer. Second, this writer says: "The first and most important error is the mileage assumed for cast-iron wheels, namely 50,000 miles." This is a point well taken. Assumption is always an error when facts can be had, but why, in the very next sentence, does the writer lower himself down to the same level by assuming a mileage for cast-iron wheels that under the most favorable circumstances has hardly ever been reached as an average service where correct individual mileage is kept and every wheel accounted for?

Railroad managers will be interested to know who the makers are that "guarantee" and make good "60,000 miles" at a cost of only \$5.30 per wheel, being "\$12 for new wheels and \$6.70 for scrap wheels" (as per written figures).

Let us consider for a moment the matter of cost; 33-in. cast-iron wheels weigh, or should weigh, 540 lbs., and it is safe to say, counting the waste and shrinkage, it will take 600 lbs. of metal to make a wheel. (I have this as a fact from a wheel-maker.) A metal that will make a "first-class" wheel will cost from 1½ to 2 cents per pound, according to location, say 1½ cents, \$10.50 per wheel for metal. Now it is pertinent to ask, can labor, furnaces, fuel, moulds, etc., be furnished for \$1.50 each? Can manufacturers afford to do business without counting investment or profit? Will they do it?

There is no limit to assumption when taken as a basis on which to found calculations, but when facts are taken your limit is defined. Now the nearer we keep to actual facts the less likely we shall be to do an injustice to any one.

Below I give a statement of facts reached by individual mileage, and the wheels referred to represent nearly all the principal cast-iron wheel manufacturers in the country, and each in sufficient numbers to give a fair average of service. The actual average mileage of wheels worn out and removed for the past nine years has been as follows:

Date.	Wheels.	Average miles.
1874.....	588	32,268 +
1875.....	866	32,620 +
1876.....	511	40,832 +
1877.....	407	46,546 +
1878.....	316	45,028 +
1879.....	300	49,651 +
1880.....	184	56,540 +
1881.....	127	34,290 +
1882.....	58	29,074 +
	3,357	

Total number of wheels removed for the nine years, 3,357; and their actual average mileage has been 39,515 + miles.

Query: What effect would a guarantee have had on these wheels?

A wolf in a trap said to the shepherd: "Have you no confidence in me?" to which the shepherd replied, "Plenty of confidence in you, but more in the trap."

We have plenty of confidence in the guarantee, but more

in the records. It is quite easily understood how it is that the Pennsylvania Railroad gives a better mileage. It makes its own wheels.

The writer can give the names of these makers, the number of wheels represented by each, and the separate average mileage through the editor of the *Railroad Gazette* should this information be desired.

Somewhere about the year 1875 it had generally become known that much attention was being given, in certain directions, to wheel mileage, thus bringing the makers to understand that quality meant patronage, and we see by the figures shown here, that they began to improve, substantially, up to 1880 (although in 1878 the mileage fell a little below the previous year), when the automatic brake was applied, and without doubt it has much to do with reducing the mileage, although I do not attribute it wholly to this cause. Cast-iron wheel-makers, beyond a question, have concluded that it is little use to compete with steel-tired wheels for passenger service, and as few roads practice a system by which mileage can be obtained for passenger-wheel service and none for freight service, think it may be perfectly safe to guarantee a poor wheel.

When we are a little suspicious that a man will not be entirely fair in his dealings, but are dependent on him for what we think we must have, it is perfectly natural to ask him to guarantee the article; but experience teaches the folly of doing so.

Railroad managers recognize the absolute necessity of, and have settled in their minds without a shadow of doubt three things:

1. We must have a safe wheel.
2. We must have a wheel turned round.
3. We must have the wheel that will give these results and the greatest number of miles for the least money, no matter who makes it.

While the writer admits that the interest is fairly computed for the steel wheel, he intimates that it is not for the iron. Now, as they both seem to be figured by the same method, the conjecture is that the trouble must be in the mind rather than in the figures. Again, the writer says: "As to the mileage of steel-tired wheels, and as steel wheels have come into extended use only in the last four or five years." This is hardly true. They have been under my observation for some fourteen years, and came into quite extended use on some roads eleven years ago.

For the year ending Jan. 1, 1883, there have been removed from this road 100 Hartford steel-tired wheels, worn out, and their actual average mileage has been 229,104 miles. Put beside 29,074 miles, the actual average for the iron wheels can leave little doubt as to advantage in cost per mile.

We had running Jan. 1, 1883, 1,615 Hartford steel-tired wheels.

384 have made between 15,000 and 100,000 miles.

618	"	"	100,000	"	200,000	"
422	"	"	200,000	"	300,000	"
71	"	"	300,000	"	400,000	"
3	"	"	400,000	"	500,000	"
2	"	"	500,000	"	600,000	"

115 put in this year (1882).

1,615

The service our wheels accomplished in 1874 or 1878 is not of so much value to us as to know what they are doing now. It is not safe to judge any human production from past records and leave it settled there.

Again, "There appears to have been no calculation made for expense of turning." This is not true. The cost of fitting, etc., \$4.50, is said to include cost of turning journal; wheel fit and putting in, \$2; changing and turning wheels, \$2.50; in all, \$4.50. "They can be flattened by sliding, and have to be re-turned every time." This is true. One of the largest railroad companies in the country slid three pairs for us 40 miles and flattened them so badly that, after repeated correspondence in reference to the matter, they concluded that the sum of \$2 per pair was liberal as payment for labor, use of "expensive machinery," loss of service in the metal turned off and for transportation some 200 miles.

After cautious mental calculation and questioning their "assumed figures," and having no means to determine the exact damage ourselves, we concluded that it might be an injustice to made the charge, so waived it entirely.

Investigation of these facts will show that the writer has been fooling himself and wasting his company's money ("assuming" the writer to be a railroad man) by assuming to be true what the wheel-makers say.

We may assume the moon to be made of green cheese, but should we visit that orb, we might wish to be a cast-iron image, if our only support happened to be green cheese.

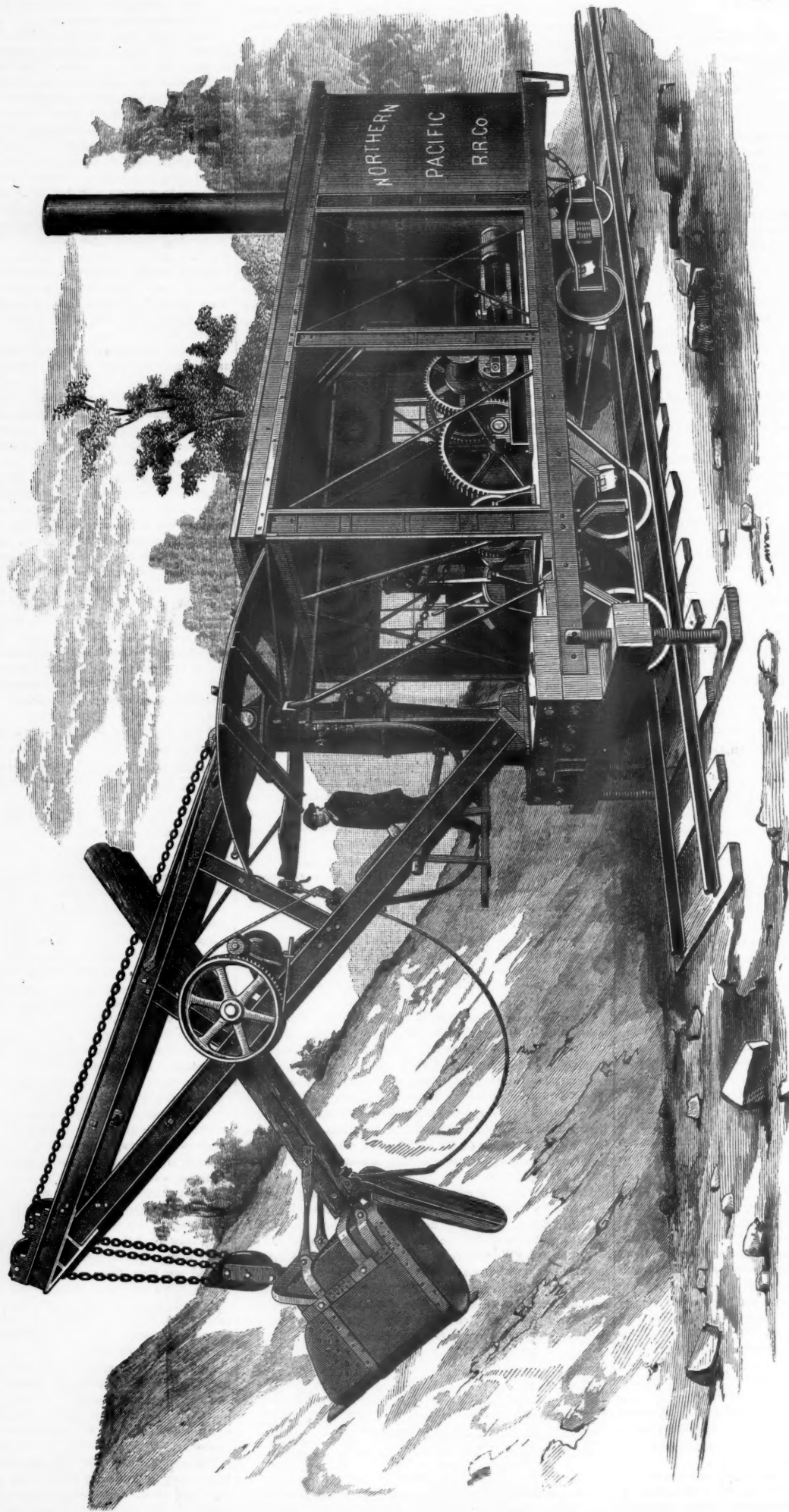
Facts demonstrate that crucible steel-tire wheels, properly carbonized, will not flatten in ordinary service, but soft open-hearth steel-tire wheels will flatten. Steel wheels must not be "all judged alike."

Again, if it be true that cast-iron wheels "balanced and turned up as perfectly as any steel wheel for \$30 per pair" can be "furnished" equal to turned steel-tire wheels "at \$100," then nearly all railroad managers must be insane not to use them, and I don't believe many are afflicted in that way.

The writer says, "Many people seem to think that there is no way to test cast wheels except by actual service." How can wheels be tested as to average life except by actual service? The writer would have us test them by breaking them up before we use them, for "strong wheels break strong and poor ones will not." I cannot see how a railroad can be operated by this process. If this is the test of service, steel or wrought-iron wheels must be the ones to use. I prefer the old custom: prove a thing by use.

With the foregoing facts before us, and the severity of the present service in mind, it must be seriously questioned

* Of Mr. Barrus' report of experiments with locomotives on the Boston & Albany Railroad in our issue of Dec. 8 last. Mr. Barrus did not see it until very recently.



COMBINED STEAM SHOVEL AND DERRICK CAR.

*Built by the BUOYBUS FOUNDRY & MANUFACTURING Co., Bucyrus, Ohio.
For Description see Page 69.*

whether the peculiar character of the metal in cast-iron wheels would meet the demands even if they were turned round.

As to cost of turning steel-tired wheels, the actual average cost with us for the past year (including interest on "expensive machinery") has been \$1.11 per pair.

When the actual facts in this and the article in your issue of Jan. 12, 1883, on "Reduction of Operating Expenses in Wheel Service" are overcome by a change of circumstances, it will be interesting to know the conditions under which it has been accomplished.

By enforcing a comprehensive system of actual individual wheel-mileage records alone can facts be reached.

A recent circumstance of reporting mileage is in mind. An article in a paper representing a certain make of wheel as recording 100,000 miles was brought to my notice, and having the records at hand of the movement of the car and the dates the wheels were put in I found there was an error in the statement. When the agent reporting this mileage was asked to show how it was possible for the wheels named to record such a mileage, and where the car was between certain mentioned dates (when, as our records showed it was in shop for repairs), he made an answer which reduced the mileage to some 70,000 miles.

NEW ENGLAND.

The Speed of Locomotives.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Now that the evidence seems all gathered in concerning the highest schedule speed of trains from various correspondents in this country, from a German newspaper and lastly from other correspondents in England, we seem forced to the conclusion that for distances of 100 to 200 miles

The highest speed in England is 51 miles per hour.
 " " America is 47 " "
 " " Germany is 38 " "

The public is daily demanding greater speed and frequency in the lines of communication between our great cities, and as they will always choose the fastest trains, notwithstanding the slight extra risk that is necessarily run, it seems a fitting opportunity with these supposed limits of speed before us to look around and inquire what features a locomotive should possess in order to secure great speed, combined with safety, and at the same time to draw heavy loads.

It is true that the Fontaine and many other engines have attained much higher speeds than these, which it must be remembered are the daily speeds of ordinary trains; but in the former case, the supposed advantage of the diminished piston speed showed its weak side when more than four or five cars were placed behind it; and in other cases there have been special facilities granted to attain speed, generally by increased care in working the engine.

We want more of that regularity and frequency of trains which exists, for instance, between Manchester and Liverpool, where, punctually on the stroke of every hour, trains start from these two cities, and almost as surely arrive three-quarters of an hour later, the distance covered being about 31 miles; while at the same time a rival railway company taking a different route is running similar hourly trains between these two cities of half a million or more inhabitants, so that throughout the whole business part of the day these two cities are connected by a half-hourly service of trains.

Now an engine to work this traffic, or any other fast or heavy traffic, must satisfy two general conditions. It must "steam well," and it must "ride well."

Under the first head we do not intend to deal with the construction of the boiler, but many a little constructional defect is often inadvertently thrown into this general accusation of *steaming badly*. We will suppose, then, that the steam is made and delivered high and dry at the throttle valve at full pressure. Now why is it that in nearly every series of indicator diagrams taken from locomotives this steam has lost 10, 20, 30, and sometimes even 40 lbs. before it reaches the piston, where it is to begin to do its work?

These great reductions of pressure have in many cases been diminished by enlarging the steam pipes. In even the best constructed of our engines, however, the steam, after passing through the throttle valve, has to traverse a tunnel some 22 ft. long, in which it encounters at least three rectangular bends, and nearly always a serious wire-drawing on entering the steam chest.

Think for a moment of the restless flow of the Niagara River down the rapids till it reaches the whirlpool, where its power is spent in dashing against the opposite bank, and the water flows off again at right angles. Here we can see the retarding power of a rectangular bend in a river; but unfortunately we can not see the imprisoned steam rushing through a T pipe, or emerging through a narrow core in a badly-designed cylinder.

Here then we have an average loss of some 10 per cent. of our original steam pressure. Some builders have tried to shorten the passage by placing the dome forward; others by collecting the steam in a large perforated pipe running the whole length of the boiler, while some engines have the throttle valve in the smoke-box, with a large open-ended pipe leading to it from the dome or domes.

These are all attempts in the right direction, but all of them must necessarily fall short of some of those admirably constructed stationary engines which admit steam to their cylinders with only a few inches of intervening pipe, and one or two of which place the cylinder actually inside the boiler in order to get the steam fresh and dry.

Whether locomotive builders can ever approach the perfection which has been attained by stationary engine builders in this respect is very doubtful, owing chiefly to the necessity of placing the cylinders below instead of above the

boiler. But the present large difference in pressure between the boiler and steam-chest indicates that here is a field for vast improvement.

I remember witnessing, some years ago, an experiment on a locomotive boiler as to what size of pipe would carry away into the air all the steam that the boiler could produce with the aid of an artificial blower. It was found that when the steam was escaping freely through a short piece of 1-in. pipe it was just possible to maintain a pressure in the boiler of 120 lbs. per square inch, which means that the resistance of a short piece (something under a foot) of 1-in. pipe to the passage of steam through it causes a loss of pressure of 120 lbs.; and from which we might reasonably conclude, without knowing it from the first-hand evidence of diagrams, that a piece of 4 or 5-in. diameter pipe 22 ft. long would form no small resistance to the passage of steam.

Another serious obstruction to steam before it commences duty is the contracted opening of valve. To remember what is possible in this direction, let us turn to any of the automatic cut-off valves in the stationary engines, and notice how quickly the port (in length the same as the diameter of the cylinder) opens, and how instantaneously it closes. It will be said that such intermittent arrangements are all very well for slow-moving engines, but are not applicable to a fast-running locomotive, and that is perhaps true of all the varieties of the Corliss gear. But has not Mr. Joy stepped out in the right direction by giving us a gear which will accelerate our valve at the points of opening and closing, while on the other hand it retards the valve at its points of extreme travel?

It is not so much in the sudden admission of steam to the cylinder that economy can be effected, but by the cutting off of the steam. For, at the time of admission the piston is almost at a stand-still when the pressure in the cylinder and steam-chest generally correspond remarkably well (*vide* any indicator diagram); but at the point of cut-off the piston is traveling fast, and all high speed diagrams indicate the lamentably slow action of the cut-off. For this reason the independent cut-off valve has not yet been abandoned in locomotive practice, as is seen in the large twelve-wheel locomotives built by the Central Pacific Railroad Company and illustrated in the *Railroad Gazette* of Oct. 20th last.

Mr. Joy when at work on marine engines found a gear which I believe to be more prompt than our common link motion, and which he has successfully placed on many locomotives. Mr. Corliss and others have found arrangements which are almost perfect in their promptness. But nothing has yet been found which by general consent can satisfactorily take the place of the Stephenson link. Is this always to be so? And are we to go on wire-drawing our steam during admission and thus sapping the very life blood of an engine before it has begun its work? Does not the cause lie in the fact that our locomotive manufacturers are so busy in this age of railroad manias, that they have no time and little necessity to compete with one another in the making of an economical engine?

One or two successful attempts have been made in the latter direction by multiplying the points of admission as in the various gridiron valves and the long neglected Allen valve; and the carefully conducted experiments on Mr. Vanderbilt's engines have indicated that at least 2 per cent. saving of steam can be claimed by the use of the latter valve.

It is, however, not only in the conveying of steam to the cylinder that the passages are often contracted, but also in its liberation through the exhaust. And here we must bear in mind that when running at high speed and cutting off early in the stroke, the volume of steam passing through the exhaust is about five times the volume of the prime vapor, and as the exhaust passages are seldom more than double the area of the steam passages; it follows that the steam is driven out by the piston more than twice as fast as it entered the cylinder. And here we find from indicator diagrams that from two to five pounds is required to force the steam out at this increased speed, through a few feet of pipe terminating in a contracted exhaust tip of 3 in. or 3 1/4 in. diameter. I have no wish to argue here against the use of small exhaust tips, but merely to draw attention to the fact of the greatly increased volume of exhaust steam when engines are running at high speed.

The obstruction to the passage of steam through a locomotive have thus far been considered. Some of the points in the machinery which are detrimental to high speed in a locomotive will now be taken up.

In order that a machine may run steadily at a high speed, its source of power and its loss of power must be constant in their action and not intermittent.

A top, for instance, can be driven at any speed short of that at which the centrifugal force will tear its particles asunder, because the force to destroy its motion is regular and not intermittent. The nearest approach to a perfectly balanced engine, apart from the innumerable and often impractical *rotative* engines, is made in the three and four cylinder engines, where all the connecting rods work around one crank and thus cause an almost continuous driving effort on the shaft. These engines are the high-speed engines of the day, though many single cylinder engines are now being manufactured for electric light purposes, mainly, I imagine, because of their cheapness.

Now, it is this principle of the mutual balance of parts which we ought to aim at in designing a high-speed locomotive; and it is due to the inventor of the Shaw engine to say that he has gone to the root of the matter, and has balanced each working part of one engine by the corresponding working part of the opposite engine. This engine is still undergoing trial, and, it is said, has given much satisfaction by the steadiness with which it rides.

But since the ordinary locomotive is not self-balanced or self-contained, let us look for a moment on the disturbing forces which seem to draw a limit to the speed at which an engine can run, and for the sake of clearness, suppose that the engine is running on a perfectly smooth track.

The chief defect arises from the distance apart of the cylinders, this cause aggravating all the little disturbing forces in each engine in proportion to the distance of the direction of these forces from the centre of gravity of the engine.

First, the upward pressure on the guides, which, acting now on one side and then on the other, causes even a visible side oscillation when the engine is starting out. In the case of inside-cylinder engines, where the centre of the cylinders are only about 24 inches apart, this side oscillation is not noticeable, because the disturbing forces are more central, and every thrust of each piston is transmitted to the wheels on both sides of the engine. And, although at high speeds these disturbing forces may succeed one another so rapidly as to cause only a tremble, it must be an important course of unsteadiness.

Next comes the all-important disturbing course, the balancing of the reciprocating parts. I leave out of consideration the revolving parts, for they can easily be balanced by hanging weights upon the wheels. In American engines, with a long wheel-base and plenty of weight on the truck, it is very difficult to detect a faulty balance. But a trip on the foot-plate of one of the light European engines with a single pair of drivers, on which half the weight of the engine is thrown, will soon convince any one that with all the experiments which have been made it is not an easy thing to balance an outside cylinder engine. The engine flicks along with little noise and no clatter of side-rods, to be sure, but with a motion far too much like that of a duck to be pleasant for the engineer, or satisfactory to the man who has periodically to turn up the tires of the small leading and trailing wheels. I merely instance these engines to show that a defect undoubtedly exists, though I believe that they are far better balanced than scores of coupled engines, whose long wheel-base and wasted weight on the truck cover a multitude of sins. And the difficulty lies in this, that if all the reciprocating parts are balanced by equal weights on the wheels, which would balance the engine well enough, these extra weights will act like steam hammers on the rails, breaking them and making the new evil worse than the old. Most engine-builders take some medium between balancing the parts by the latter method and neglecting the reciprocating parts altogether; a common rule being to balance two-thirds of the reciprocating parts. But the waddling motion can never be overcome as long as cylinders are placed so far apart. If the footprints of a man running be examined, they will be found to be all in one line, each thrust of the foot being straight towards his centre of gravity; and notwithstanding this and many other simple examples in animal mechanics, we go on placing the lower limbs of our locomotives (the cylinders) six feet and sometimes even seven apart.

There is one other advantage for inside cylinder engines, which is taken advantage of in England, namely, that the stroke of the coupling-rod can be made shorter than that of the piston; for example, a recently designed express engine has a stroke of 26 in., while the throw of the coupling-rod is only 18 in., thus making less revolving weight to balance.

If the reader has accompanied me in the foregoing remarks, I think he will agree that it is impossible to balance the ordinary locomotive. Here is one of the causes of the limits to speed, which locomotives have already attained.

This cause is not as potent as the condition of the track itself, every little irregularity of which is an obstacle to speed. But the strains caused by these unbalanced forces are those which shake an engine to pieces, and cause so many failures at high speeds.

To illustrate the system of a perfect balance still further, reference may be made to the English iron-wheel railway carriage, the axle guards of which are hung directly to the frames. The wheels consist of steel tires with blocks of teak forced in to form the centre. For a long time these carriages trembled in an unaccountable way, when running at high speeds, so much so that it was impossible to read a newspaper when traveling; until the defect was discovered in the bad balance of the wheels. Each wheel is carefully rectified now after it is put together by inserting lead until the last ounce brings the centre of gravity exactly to the centre of the axle; after which the carriages travel as smoothly as most of the palace cars of this country, notwithstanding the disadvantage of having the axle guards attached rigidly to the carriage frame.

The increased height of the centre of gravity above the rail level does not seem to be any detriment to the high speed of a locomotive, as is found in practice by Mr. Wooten's engines on the Reading road. It may even be claimed as a benefit, in so far as the weight is removed further from the violent side movements of the wheels, and is therefore more completely left to obey the first law of motion.

I have but mentioned in this article only some of the chief points in which our locomotives, intended for fast running, might be improved. For slow-running engines the steam passages are already sufficiently large, and the matter of balance is not so all-important. But when an engine is to travel at upwards of 60 miles an hour, it must be a well-proportioned machine, and not a mere beast of burden. We are too apt to strain at a gnat and swallow a camel in our improvements. As a practical man sarcastically exclaimed the other day to a friend who was explaining an elaborate contrivance for preventing pieces shaking loose, ending with a split pin, "And what holds the split pin?" So we imagine we can hear the simple and everlasting laws of

mechanics laughing at some of our crude means of attaining high speeds in locomotives.

[Some, what are assumed to be facts by this correspondent may, it is thought, be questioned. Is it true that the steam-pressure in the cylinders of well designed locomotives, when running at high speeds and with the throttle wide open, is from 10 to 40 lbs. less than it is in the boiler? The evidence of this fact would at any rate be interesting.]

Second, is the loss of pressure, if it exists, due to high piston speed? If so, larger wheels with cylinders proportioned thereto would cure the evil.

Third, what reason is there for thinking that reduced cylinder pressure prevents fast running? It is of course true that a given engine will run faster with a high pressure in the cylinders than it will with less pressure, but assuming that some loss in passing from the boiler to the cylinder is inevitable, why would not the evil be cured by increasing the size of the cylinders or the pressure in the boiler?

The statement of our correspondent that "it was just possible to maintain a pressure of 120 pounds in a boiler from which the steam was permitted to escape through a 1-inch pipe something less than a foot long," and the inference therefrom that "this means that the resistance of the short piece of pipe causes a loss of pressure of 120 pounds," is a curious confusion of cause and effect. If the boiler had been only half as large as it was, probably the pressure which could have been maintained would have been much less than 120 pounds, and if it had been twice as big, the pressure which could be maintained would have been much greater, so that it will be seen that, according to this reasoning, the resistance which such a pipe would offer to the flow of steam varies with the size of the boiler to which it is attached, which is a *reductio ad absurdum*. The "conclusion" from such reasoning "that a piece of 4 or 5-inches diameter pipe 22 feet long would form no small resistance to the passage of steam," has not that degree of definiteness which should be characteristic of all scientific knowledge.

In considering the effect of imperfect balancing, our correspondent's statements would have been more satisfactory if there had been some stronger evidence than mere hearsay or personal sensation, with reference to the greater unsteadiness of outside as compared with inside-cylinder engines. Can it be proved that the outside-cylinder engines with a single pair of driving-wheels and a leading truck, which are running on the Great Northern Railway of England, are more unsteady than those with inside cylinders, and a single pair of driving and leading wheels on the London, Brighton & South Coast Line. If so, the proof will be very interesting. That the steadiness of locomotives is an important element in fast running will, of course, not be denied, but it is not clear from our correspondent's showing that an inside-cylinder engine can be made so steady that it can run fast, whereas one with outside cylinders is necessarily so unsteady that it cannot.—EDITOR RAILROAD GAZETTE.]

January Meeting of the Master Car-Builders' Club.

The regular monthly meeting was held at the rooms, No. 113 Liberty street, New York, Jan. 18.

The PRESIDENT called the meeting to order and announced that the subject for consideration would be "Car Wheels and Gauges for Seating Wheels on Axles—Rail Sections and Track Gauges." He called attention to the great improvement that had taken place in the manufacture of wheels during the last few years, and requested the manufacturers of wheels to express their views freely. One of the points for discussion he said would be the coning of wheels, about which there was much difference of opinion.

Mr. BLACKALL.—Will the wheel makers state what in their opinion is the occasion of so much chill-cracking in the plates of wheels?

The PRESIDENT.—I supposed that wheel-makers kept all their chill-cracked wheels at home. I have seen the cracks filled up with a preparation of some kind and then put in service. That was before the time of guaranteeing wheels.

Mr. MARDEN.—I recently saw some chill-cracks through the plates of cast-iron wheels. In one instance there was a chill-crack about 8 in. long across the plate of the wheel, or rather where the double plate came together before it met the head of the wheel, and about $\frac{3}{4}$ in. or more deep. Another was about 6 in. long. We had quite a number of wheels of that description and refused to take them.

Mr. SWETT.—Wheel-makers understand a chill-crack to be one in the tread of the wheel. By a crack in the plate, Mr. Blackall must mean a broken plate. We would not consider a wheel cracked in the plate as a good wheel. It may be due to the wheel being badly formed and not adapted to the expansion and contraction from the heating of the tread of the wheel or from a hot journal, or there may be a strain in the wheel when it is cast. I recently saw a lot of about 200 wheels, and the manufacturer said he thought one-fourth of them were cracked in the brackets. I know that these wheels were made of good iron. It endangers a wheel very much to have a strain on the plate after it is cast. We have often seen wheels made of first-class iron, apparently, that were broken before they were put under the cars.

Mr. MARDEN.—I have refused wheels with these cracked plates, but have agreed to take wheels where there are three brackets cracked, provided they are not in the same part of the wheel. I would ask car-builders and wheel-makers whether they would consider wheels safe to run with the brackets cracked in that way or not.

Mr. SWETT.—We made an experiment recently with two differently formed wheels. Both wheels were cast from the same ladle of iron, and both were taken from the chill as soon as they were cool enough to be taken out. They were

still quite hot and set up with a pig of iron in the hub of each wheel. Both rested in the same way, so that both had the same advantage in cooling; and in the morning one of the wheels was broken across the tread from one side to the other, and the other wheel stood I think it was 32 or 36 blows with a sledge. While one wheel broke in cooling, the other wheel stood thirty odd blows, and both were cast out of the same ladle of iron. The two wheels were of entirely different patterns, as you see it must have been something in the form of a wheel. I certainly as a wheel-maker should consider any wheel that is cracked in the bracket unsafe. If there was one bracket cracked, I should say the wheel was under a strain and unsafe.

Mr. CREAMER.—Mr. Swett's remarks militate strongly against cast-iron wheels, and the question arises whether the time has not come to make some change in that matter.

Mr. SWETT.—We have made about 40,000 wheels from one pattern, and not more than two of these have broken in four years.

The PRESIDENT.—Wheels with cracked ribs ought not to be run, unless simply to their destination to have freight delivered.

Mr. BAKER (of the Baltimore Car-Wheel Co.).—I do not think that any wheel is safe that has a defect of any kind in it, whether a crack in the plate or in the brackets or in the rim of the wheel.

Mr. BLACKALL.—Suppose that two or three of the ribs in a wheel were cracked, and you kept watch of that wheel and it ran for months and did not get any worse?

The PRESIDENT.—Twenty years ago I ran a wheel with a cracked plate for a number of months. To-day I would not knowingly permit a wheel to be run with a cracked plate or ribs, especially under a car for passengers.

Mr. SWETT.—It must be apparent that if a wheel cracks in its bracket, there is a strain on the centre of the wheel from the rim. In cooling, the hub has shrunk away from the tread, and as cast iron does not stretch a great deal, something must give. If you put a wheel under a car with a strain on it, it is liable to break when it gets a sudden blow. Mr. Blackall told me of a wheel on his road that had been running some twelve years. It was a good, sound wheel, and had never shown any defect whatever. But in going over the road he found that it was broken, and he got off the train and took his rule and put it flatwise through the crack in the plate. He went up the road for some distance, and when he came back it was some time before he could find that wheel. It had been slid down the grade, and the tread of the wheel had become hot and had expanded from the plate and from the hub, and had pulled the plate in two, and while he was gone it had cooled off and gone back again.

Mr. BLACKALL.—I will ask the President whether he instructs the car inspectors on his road to examine the brackets of wheels and to sound them.

The PRESIDENT.—We abandoned the sounding of wheels some time ago. We examine not only the brackets but the whole wheel by eye and hand.

Mr. SWETT.—A wheel which has a strain on it is not as safe as it would be if it were relieved from that strain.

The PRESIDENT.—Has anyone here any data showing the wear of wheels when they are seated on an axle at different distances from the journal, or showing the effect in wear of having two wheels of a different size on the same axle. It is very important that a system of seating wheels on axles should be adopted which will insure their being the same distance from the journal on each end of the axle and also their being the same diameter.

Mr. C. E. GAREY.—I had a number of wheels last summer carefully inspected and measured with the view of finding out any peculiarity that might occur in the wear of the wheels and axles, and I will give you a few figures in a condensed form that I gathered from the report that I made, and you can draw your own conclusions.

Of 247 pairs of wheels removed, 144 pairs were evenly worn on the tread. I mean by that that the tread of each wheel was worn alike—worn as we would like to have wheels wear; 95 pairs had a sharp flange on one wheel of each pair; 8 pairs had the tread of one wheel worn, while the other was worn evenly. Of the 95 pairs with sharp flanges, 56 pairs had the outer edge of the tread of one wheel worn as we should naturally expect to find it, while the other 39 pairs had one wheel evenly worn on the tread, which is not so easy of explanation; one wheel being worn all right and the other one with a sharp flange, 57 of these wheels were the smallest but two of different diameters on the same axle; 11 occurred where the wheels were of the same diameter. Why a wheel should have a sharp flange when it and its fellow are of the same diameter is something I do not pretend to explain; 59 of these wheels with sharp flanges were the longest distance from the inside collar of the axle to the flange of the wheel. Sixteen were the shortest distance and 20 were of equal distance from the flange of the wheel to the collar of the axle. There were 16 where it was the shortest distance and 59 where it was the longest. There appears a difference of $\frac{1}{8}$ from the inside of the axle collar to the flange of the wheel and $\frac{3}{8}$ in diameter of wheels on the same axle. With wheels pressed on equally I found $\frac{1}{8}$ in variation of length of axle, but no perceptible difference in the wear of the wheels or axles; so that it would appear to be admissible to have an axle a little short or a little over—say $\frac{1}{8}$ of an inch—and not necessarily make any difference in the wear of the axle. And also in pressing on the wheels, there might be a variation of $\frac{1}{8}$ of an inch without any difference in the wear of the wheels or axle.

Of 243 axles measured 108 varied less than $\frac{1}{8}$ from standard length, 28 were short from $\frac{1}{8}$ to $\frac{3}{8}$, and 107 were long from $\frac{1}{8}$ to $\frac{3}{8}$, making a variation of $\frac{3}{8}$ of an inch from the length of the standard axle. In most cases the over lengths are accounted for in the wear of the collar. There was also a variation of $\frac{1}{8}$ to $\frac{3}{8}$ in length of journals and from $\frac{1}{8}$ to $\frac{3}{8}$ in journals on the same axle.

The PRESIDENT.—From the record given it would seem to be admissible to have a variation of $\frac{1}{8}$ of an inch in the length of axle and about the same in the distance between the flange of the wheel and the centre of the journal. Anything over that appears to be decidedly detrimental to the wear of the axle, wheels, track and the power to move the car. I am inclined to think that by taking 100 wheels promiscuously from freight equipment as it is now interchanged, a variation in the gauging of wheels of from $\frac{1}{8}$ to $\frac{3}{8}$ in., or possibly more could be found. By actual tests I found from $\frac{1}{8}$ to $\frac{3}{8}$ in. within the past month.

There should be, I think, a limit within which railroad companies should receive from manufacturers wheels out of round. I should like to hear from wheel manufacturers how much, in their opinion, a wheel should be out of round to condemn it.

Mr. SWETT.—How much do wheels come out of round as a general thing?

Mr. BLACKALL.—The question might be answered better by telling us how much your chills are out of round.

Mr. SWETT.—We have had chills that stood ten, twelve and fifteen years, and on measuring them found they were oblong, and we got up new patterns and had entirely new chills made, and we then found our wheels were decidedly more true.

Mr. C. E. GAREY.—What per cent. of the wheels do the makers claim are perfectly round?

Mr. BAKER.—Wheel-makers do not claim that any per cent. of wheels are perfectly round. It is not possible to make a chilled wheel perfectly round. But good wheel-makers take every precaution to make the wheels as nearly round as possible. We gauge the chills in our foundry every day to see whether they are round. If they are not we condemn them.

Mr. ADAMS.—To what extent do you allow them to get out of true?

Mr. BAKER.—We do not allow them to get out of true at all. You will find the steel-tired wheels probably more out of balance than the chilled wheels.

The PRESIDENT.—From the remarks made I infer that a wheel $\frac{1}{8}$ in. out of round ought not to be offered or received by a railroad company, or by any parties using them under cars. I am somewhat anxious that there should be a limit placed because I am in hopes soon to be prepared to condemn wheels which are out of round beyond some fixed limit.

Mr. SWETT.—I advocate the use of cast-iron wheels. I do not say that they are better than steel wheels; but I think they are the cheapest and best wheels. A poor cast-iron wheel ought not to go on a road.

The PRESIDENT.—We have no mode of testing wheels other than to put them in service. We test axles. But I do not know of any mode of testing cast-iron chilled wheels other than actual use. Occasionally they are broken up by a sledge to see how strong they are.

Mr. BLACKALL.—Is it the intention of the wheel-makers to have us test their wheels in that manner before we use them?

Mr. C. E. GAREY.—How much do the wheel-makers think a wheel should be allowed to be warped or twisted? I have found wheels that were half an inch out.

Mr. ADAMS.—Mr. Swett, I think, is a good deal in the right about the form of the patterns. It, no doubt, has a great deal to do with the strain on the wheels. If a pattern is formed correctly, it will make a much better wheel than if it was not formed so. A wheel with a plate cracked, I should call a cracked wheel. A wheel with moderate chill cracks in it is no worse for them, such wheels are often the very best wheels to wear which you can pick out. I should not advise the condemnation of a wheel with a $\frac{1}{8}$ of an inch crack in the tread. If the plate of a wheel is cracked, I condemn it at once. If one or two brackets are cracked, I should not consider it dangerous. If two or three or four of the brackets were cracked, I should think there was more liability of its giving way. Mr. Garey condemns a wheel if he finds one bracket cracked. I believe in steel wheels. I do not believe there is a round cast-iron wheel in creation, if we depend on the chill to make it round. I find that they vary all the way from $\frac{1}{8}$ up to $\frac{3}{8}$ of an inch.

The wheel-makers, for their own interest and to be honest, must take the course Mr. Baker refers to and test their chills every day to see whether they are round or not. The wheel-makers are, no doubt, getting into the way of examining their chills more closely than before.

My attention was called the other day, in our shops, to some wheels just sent us, in which three or four of the brackets were broken. They had not even been bored. I believe Mr. Garey thought those wheels ought never to have left the foundry, and I would not advise anybody to send wheels to us with any cracked brackets. But, still, if I should find that one or two wheels in a hundred had a cracked bracket, I should not throw them out. Mr. Garey here was showing us his statistics regarding the wear of flanges. One point he did not allude to which is one of the most serious causes for the wearing of flanges. It is the hard resting of the car body on the side-bearing which prevents the truck from curving. You may put your wheels in just as perfectly as you please, and let your car rest hard on the side-bearings, and it will wear your flanges out all the time.

Mr. BAKER.—After a steel-tired wheel has run 100,000 miles, I will guarantee that you will find that it will be less round than a chilled wheel which has been through the same service, if you applied brakes to the wheels. You can take a chilled wheel and turn it and bring it perfectly round and put it in service again. A properly chilled wheel cannot be made at a foundry at the prices at which wheels are selling at the present time.

Mr. MARDEN.—We have had quite a number of slid wheels of late, and I have been watching them closely so as to satisfy myself of the cause. I have reduced the brake leverage on our passenger trains and also on our freight cars to where I thought it ought to be right, and out of the large number of wheels that I have examined that have been flattened by sliding, I find that the flat place is almost invariably on the smaller circumference of the wheel when it is out of round.

If wheels were perfectly round we would have much fewer slid wheels. I have yet to find a flattened steel wheel under our passenger cars caused by sliding. There are several causes for sharp flanges. One is the truck being out of square. I have started a car from North Adams with one cracked bracket—our road is quite crooked—and when the car came into Boston it had two cracked brackets. We have instructed our inspectors to receive wheels with three cracked brackets in the wheel.

The PRESIDENT.—It appears that parties who have designed rails have never taken into account that there were flanges to wheels which were made to run on the rails, as there certainly is no unity in the form of the rail and the wheel flange, some of the rails being very sharp in the corner and receiving the wear upon a very small surface of the flange.

From what I have heard there appears to be really no standard by which trackmen are governed in setting guard rails. The old plan was to have a clearance of 2 in. at the point of the frog, in the frog and 2 or 2 $\frac{1}{2}$ in. between the guard rail and the main rail alongside the point of the frog. Most roads have now reduced that distance to 1 $\frac{1}{2}$ in. Now if you allow $\frac{1}{8}$ in. or $\frac{3}{8}$ in. lateral play in seating your wheels, and the flanges of the wheels are $\frac{1}{4}$ in. thick, it would leave a distance between the flanges of 4 ft. 5 $\frac{1}{2}$ in. If the space between the guard rails and main rails was 1 $\frac{1}{2}$ in. it would leave the distance over all 4 ft. 5 in. Now if the guard rails are set on curves, as they sometimes are, without any reference to the spread of the track, and exceed that distance in order to pass the wheels through, it would cause either a loose wheel, a bent axle or a loose guard-rail. Something must give way. I was in hopes that there would be a number of trackmen here this evening who would tell us how their tracks were laid.

Mr. LENTZ.—The wheels removed by the Pennsylvania Railroad Company amounted to 40 per cent. on account of their flanges. The wheels we removed amounted to only 4 per cent. on account of their flanges. We attributed the fact of there being a lesser number of short flanges on our road to the form of our rail section, which fits the throat of our wheels. On many roads you will find the rail is sharp, and after it is worn for some time, you will find that it wears down to the form of the throat of the wheel.

The PRESIDENT.—It would seem evident that a sharp corner for the flange to strike against would wear the flange away more than it would if you had a larger bearing. If that is the case, why should not a rail be made on its edge to conform more to the shape of the head of the wheel? The

rails on curves, you will find, are worn very much the shape of the flange of the wheel.

Mr. LENTZ—I find quite a number of wheels received from foundries are cracked where the two plates come together, right in a circle, and it has often been a question with me whether they should be condemned or not. I have had a number of them tested in the manner suggested by Mr. Swett, and I find that they will break at almost every other place, excepting just where that crack appears. My experience with crack wheels in treads has been very much the same as that of Mr. Adams. I have had a number of such wheels tried with a sledge, and find that they break everywhere excepting where the crack appears. That always seems to be the strongest part of the wheel.

Mr. BAKER—I would not allow any wheel to go on a road that had a crack in it.

After a little further discussion the meeting adjourned.

ANNUAL REPORTS.

The following is an index to the annual reports of railroad companies which have been reviewed in previous numbers of the current volume of the *Railroad Gazette*:

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The following brief preliminary statement is made for the year ending Dec. 31.

The earnings for the year were as follows:

	1882.	1881.	Inc. or Dec.	P. c.
Earnings.....	\$20,386,726	\$17,025,462	I. \$3,361,264	19.7
Expenses.....	12,186,073	10,317,931	I. 1,868,142	18.1
Net earnings.....	\$8,200,653	\$6,707,531	I. \$1,493,122	22.3
Gross earn. per mile.....	4,752	4,445	I. 307	6.9
Net earn. per mile.....	1,912	1,751	I. 161	9.2
Per cent. of exps.....	59.8	60.9	D. 1.1

Comparisons are made with the full report for 1881.

The income statement is as follows:

Net earnings, as above.....	\$8,200,653
Interest on bonds paid, and 7 per cent. on common and preferred stocks.....	7,581,041
Surplus to profit and loss.....	\$619,612

The cash receipts from sales of lands during the year were \$1,014,223, which, added to the surplus above, makes a total surplus of \$1,633,835. The company has never reported the receipts from land sales before.

Boston, Barre & Gardner.

This company owns a line from Worcester, Mass., to Winchendon, 36.5 miles. The following statements are for the year ending Sept. 30.

The capital stock is \$871,900. The funded debt is \$654,000, of which \$554,000 are first and second mortgage bonds on which the interest has been reduced by agreement to 5 per cent., and \$100,000 third-mortgage, convertible, 6 per cent. bonds. The interest charge is thus \$33,700 yearly.

The earnings for the year were as follows:

	1881-82.	1880-81.	Inc. or Dec.	P. c.
Earnings.....	\$187,280	\$174,688	I. \$12,592	7.2
Expenses.....	138,474	156,310	D. 17,836	11.4
Net earnings.....	\$48,806	\$18,378	I. \$30,428	165.4
Gross earn. per mile.....	5,131	4,786	I. 345	7.2
Net.....	1,337	504	I. 833	165.4
Per cent. of exps.....	73.9	89.5	D. 15.6

The earnings last year were made up of \$76,679 from passenger trains, \$109,133 from freight trains, and \$1,468 from rents.

The result of the year was as follows:

Net earnings.....	\$48,805.73
Interest on funded and floating debt.....	38,308.08
Surplus for the year.....	\$10,497.65

This surplus was equivalent to 1.2 per cent. on the stock; it contrasts with a deficit of \$16,459.33 in the preceding year.

Long Island.

This company owns a main line from Hunter's Point, N. Y., through the centre of Long Island to Greenport, 95 miles, with 84 miles of branches, and it leases 173 miles of branches, making 352 miles worked, an increase of 18 miles over the previous year. The following statements are from the report to the New York State Engineer for the year ending Sept. 30 last.

The stock and debt were as follows:

Stock.....	\$10,000,000
Funded debt.....	4,169,925
Unfunded debt.....	254,015
Total.....	\$14,423,940

There was an increase during the year of \$39,300 in stock and \$1,478,723 in bonds, and a decrease of \$187,960 in unfunded debt. Part of the increase in bonds was due to conversion of guaranteed bonds of leased lines into the company's new consolidated bonds.

The traffic was as follows:

	1881-82.	1880-81.	Increase.	P. c.
Passengers carried.....	8,878,453	6,512,270	2,366,183	36.3
Passenger-miles.....	83,867,396	64,714,438	19,152,958	29.6
Tons freight carried.....	386,200	339,252	47,008	13.9
Ton-miles.....	14,558,981	12,280,205	2,278,776	18.5

There was a very large increase, especially in the short-distance or suburban passenger travel.

The earnings for the year were as follows:

	1881-82.	1880-81.	Inc. or Dec.	P. c.
Passengers.....	\$1,608,771	\$1,237,837	I. \$370,934	29.9
Freight.....	634,698	567,055	I. 67,643	11.9
Mail, etc.....	173,558	141,777	I. 31,811	22.4
Total.....	\$2,416,927	\$1,946,669	I. \$470,258	24.2
Expenses.....	1,576,775	1,576,372	D. 403	10.2

Net earnings.....\$840,282
Gross earn. per mile.....0.867
Net earn. per mile.....2.387
Per cent. of exps.....65.2

The increase in earnings was very large, and was derived chiefly from passengers. The result of the year was as follows:

Net earnings, as above.....	\$840,282
Interest and rental charges.....	393,505
Surplus.....	\$446,777

Since the close of the year two dividends of 1 per cent each has been paid. The first of these was the first dividend ever paid by this company.

Lehigh Valley.

This company owns a line from Perth Amboy, N. J., to Wilkesbarre, Pa., 161 miles, with numerous branches and spurs in the Lehigh coal region in Pennsylvania. The statement of track given in the report is as follows:

Main track, main line and branches.....	312.25
Second track.....	172.93
Second track laid, but used as sidings.....	12.14
Sidings.....	244.25
Total track.....	741.50

The increase during the year was an extension of the Bear Creek Branch, main track, 6.73 miles; also 6.24 miles of new second track on main line and 25.38 miles of new sidings; from this is to be deducted 1.07 miles formerly classed as main track (on the Wyoming Division), but now included in sidings, and 3.20 miles formerly sidings, but now second track, making a net increase of 34.08 miles in track. The report is for the year ending Nov. 30.

The equipment consists of 392 locomotives; 85 passenger and 45 baggage and express cars; 2,179 box, 1,609 flat and gondola, 13 stock, 50 bark, 44 line, 26,005 coal, 150 tunnel coal and 85 caboose cars; 1 pay-car, 30 wreck and tool, 5 water, 19 supply and 294 gravel cars.

The liabilities are as follows:

Preferred stock.....	\$106,300
Capital stock, including scrip not yet converted.....	27,496,895
Total stock.....	\$27,603,195
First mortgage, 6 per cent. bonds.....	5,000,000
Second mortgage, 7 per cent. bonds.....	6,000,000
Consolidated mortgage, 6 per cent. bonds.....	4,013,000
Sterling.....	1,952,000
Coupon.....	7,498,000
Registered.....	560,000
Annuity.....	14,013,000
Total stock and bonds.....	\$52,616,195

On Dec. 1 there were 159 sterling consolidated bonds drawn for payment, leaving only \$3,854,000 now drawing interest.

The report says: "The second-mortgage bonds of the Southern Central Co., of New York, amounting to \$400,000, endorsed and guaranteed by this company, as approved by the stockholders in January, 1878, fell due on March 1 last, and were taken up and paid for by us under an agreement with that company and the holders of the greater part of its first-mortgage bonds, under which both the existing mortgages were to be canceled and a new one created at a reduced rate of interest of sufficient amount to include all their indebtedness and provide means for additional business. This agreement is now being carried out and will be completed as soon as it is assented to by the holders of a few of their first-mortgage bonds."

The President's report gives the following statement of the total receipts, including interest on investments, etc., and of the disposition of net earnings:

	1882.	1881.	Inc. or Dec.	P. c.
Total income.....	\$11,239,312	\$10,392,126	I. \$847,186	8.2
Expenses of road.....	5,833,677	4,648,084	I. 1,185,593	25.5
Net income.....	\$5,405,635	\$5,744,042	D. \$338,407	5.9
Net income, as above.....	\$5,405,635	\$5,744,042	D. \$338,407	5.9
Interest on bonds, including guarantied bonds.....	\$2,019,733.72	2,350,516.50	D. 330,782.78	15.7
Dividends.....	375,490.36	554,348.93	D. 178,858.57	47.8
Estimated accumulated depreciation.....	5,300,089.51			

Balance to profit and loss.....\$105,545.91

The improvements at Buffalo are in excellent condition and will be of great advantage in the future. The company's line of lake steamers is proving very successful, and is a paying investment.

The President's report refers to the resignation of Mr. Robert H. Sayre as Superintendent and Engineer, and to his long connection with the company.

The report also refers to the deaths of Mr. Ashbel Welch and Mr. David Thomas, the two senior members of the board of directors, both in years and length of service.

The traffic for the year was as follows:

	1882.	1881.	Increase.	P. c.
Passengers carried.....	1,786,854	1,465,387	321,467	21.9
Passenger-miles.....	23,449,247	23,123,806	325,441	1.4
Tons merchandise.....	3,685,436	3,486,432	199,004	5.7
Mer. ton-miles.....	216,411,652	202,299,245	14,112,407	7.0
Tons anthracite coal.....	6,257,150	5,791,376	465,773	8.0
Coal ton-miles.....	170,054,375	156,437,244	13,617,131	8.7
Above Mauch Chunk.....	320,366,406	284,189,455	36,176,951	12.7
Total.....	490,420,781	440,626,699	49,794,082	11.3

The total tonnage of coal, including bituminous, for five years has been: 1882, 6,336,141; 1881, 5,870,701; 1880, 4,672,724; 1879, 4,415,285; 1878, 3,479,593. The tonnage of bituminous coal last year was 78,982 tons.

Of the anthracite tonnage last year 1,322,713 tons were from the Wyoming Region; 2,919,219 tons from the Hazleton Region; 688,129 tons from the Beaver Meadow Region; 1,477,069 tons from the Mahony Region, and 29 tons from the Upper Lehigh.

Of the total tonnage 1,874,997 tons were carried over the New Jersey Division to Amboy; 1,404,717 tons delivered to the Belvidere Division, Pennsylvania Railroad, and 708,730 tons to the Pennsylvania & New York road.

The earnings for the year were as follows:

	Earnings.	Expenses.	Net earnings.	Per cent. of exps.
Coal.....	\$7,158,744	\$3,839,215	\$3,319,529	53.6
Freight.....	2,269,021	1,453,280	815,742	64.0
Passengers, express and mail.....	732,305	541,173	191,132	73.9
Total.....	\$10,160,070	\$5,833,677	\$4,326,393	57.4
Total, 1881.....	9,423,858	4,648,084	4,775,774	49.3
Inc. or dec.....	I. \$736,212	I. \$1,185,593	D. \$449,381	I. 8.1
Per cent.....	7.8	25.5	9.4

Each branch of business shows an increase in gross receipts over those of any previous year, except that the passenger receipts were slightly exceeded in 1878, when there was a very heavy travel to the Centennial.

The expenses were increased by very heavy renewals and by the general increase in prices. There was also a decrease in the average rates received for transportation of coal, although the rates on general freight were the same as in the previous year.

There are now 485.63 miles of steel rails in the track, an increase of 43.45 miles last year. There were used during the year 20,574 steel rails, 5,475 new iron rails and 329,323 new ties.

A number of bridges were renewed and many new buildings for station and shop purposes were erected.

Additions to the main track during the year were the extension of the Bear Creek Branch 6.73 miles. To second track 6.24 miles were added, and to the sidings 25.38 miles.

Work begun, but not completed, includes 7.54 miles of second track; a branch 2 1/4 miles long from Musconetcong, N. J., to the Warren Paper Mills; the enlargement of the Packerton yard, and the third track at Mauch Chunk. Work has been begun on the Rockport tunnel, which will save 1 1/4 miles in distance and 351 degrees of curvature.

The new line between Penn Haven and Black Creek Junction is completed and in use with very satisfactory results.

The condition of the relief fund is as follows:

Cash, Dec. 1, 1881.....	\$2,403.93
Contributed by employees.....	10,643.45
" " company.....	10,643.45
Total.....	\$23,690.83
Disbursements.....	16,121.86
Balance, Nov. 30, 1882.....	\$7,568.97

There were three calls made during the year; to the last call 2,377 employees responded.

LEHIGH VALLEY COAL CO.

The operations of the Lehigh Valley Coal Co. for the year are reported as follows:

	1882.	1881.	1880.
Coal mined from Co.'s collieries.....	1,397,710	1,508,720	1,386,033
Coal mined by tenants, from Co.'s lands.....	1,633,203	1,160,819	849,412
Total.....	3,030,913	2,669,539	2,235,445

The increase last year over 1881 was 361,374 tons, or 13.5 per cent. This tonnage is mainly transported to market over the Lehigh Valley road and its controlled lines.

The destination of the coal mined by the company was as follows:

	1882.	1881.	1880.
Northern and Western markets.....	570,044	630,000	432,533
Line and Eastern markets.....	827,606	878,720	953,500
Total.....	1,397,710	1,508,720	1,386,033

In the latter part of the year a breaker at the Packer colliery was destroyed by fire, but is now nearly rebuilt.

All the mines are reported in good condition, and prepared to make a considerable increase in output, should the market require it.

Pennsylvania & New York.

This company, which is controlled by the Lehigh Valley Co., owns a line from Wilkesbarre, Pa. to Waverly, N. Y., 105 miles, with numerous short branches and connections. The total mileage of track, including second track, spurs and sidings, is 265.53 miles, an increase of 28.43 miles (of second track and sidings), during the year. Of these tracks 181.53 miles are laid with steel rails, 83.24 miles of steel having been put in last year. The report is for the year ending Nov. 30.

The equipment consists of 64 locomotives; 631 box, 77 stock, 288 flat and gondola, 1,301 eight-wheel coal, 2,850 four-wheel coal and 31 caboose cars; 4 wrecking, 58 gravel and 6 shop cars. The increase was 11 engines and 25 gravel cars. Passenger equipment is furnished by the Lehigh Valley Co.

The stock is \$1,061,700 common and \$4,000,000 preferred. The funded debt consists of \$3,000,000 first-mortgage 7 per cent. bonds, of which one half will be due in 1896, and one half in 1906.

The traffic for the year was as follows:

	1882.	1881.	Inc. or Dec.	P. c.
Passengers carried.....	240,336	212,018	I. 28,318	13.4
Passenger-miles.....	8,016,694	7,624,280	I. 392,414	5.2
Tons merchandise.....	1,908,168	1,057,582	I. 850,586	2.1
Mer. ton-miles.....	90,593,344	85,902,108	I. 4,691,236	5.5
Av. rate.....	2.50 cts.	2.39 cts.	I. 0.17 cts.	7.1
Per passenger-mile.....	0.82	0.82	I. 0.17 cts.	7.1
Tons coal carried.....	1,076,967	1,108,056	D. 31,089	2.8
Anthracite.....	371,005	419,551	D. 48,546	11.5
Bituminous.....	1,447,972	1,527,607	D. 79,635	5.3
Coal ton-miles.....	92,975,205	96,305,465	D. 3,330,260	3.4
Anthracite.....	10,166,470	11,023,386	D. 856,916	7.8
Bituminous.....	103,141,675	107,228,851	D. 4,087,176	3.8

The bituminous coal was mined on the line or received from the Barclay road. With the exception of 48,999 tons shipped southward and 7,349 tons used on the line of the road, it was all shipped north or west from Waverly.

Of the anthracite coal 708,730 tons were received from the Lehigh Valley road. There were 151,677 tons shipped northward over the Southern Central road and 349,133 tons over the Geneva, Ithaca & Sayre, while 455,401 tons went westward over the Erie. Of the shipments over the Erie 234,561 tons were hauled to Buffalo by this company's locomotives. The shipments of anthracite coal westward in box cars were 278,090 tons.

The earnings for the year were as follows:

	1882	1881	Inc. or Dec.	P. c.
Coal.....	\$1,343,306	\$1,339,497	I. \$3,809	0.3
Freight.....	743,400	701,923	I. 41,477	5.6
Passenger, mail and express.....	300,522	179,240	I. 121,273	11.9
Miscellaneous.....	16,316	23,416	D. 7,100	30.7
Total.....	\$2,393,544	\$2,244,085	I. \$149,459	6.7
Expenses.....	1,290,143	1,243,370	I. 46,773	3.8
Net earnings.....	\$1,043,401	\$1,000,706	I. \$42,695	4.3
Per cent. of exps.....	54.70	55.41	D. 0.71	



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EDITORIAL ANNOUNCEMENTS.

Passes.—All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.

Addresses.—Business letters should be addressed and drafts made payable to THE RAILROAD GAZETTE. Communications for the attention of the Editors should be addressed EDITOR RAILROAD GAZETTE.

Contributions.—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subject pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

THE USE OF SCRAP IN MAKING CAR WHEELS.

I.

A valued correspondent who is likewise a railroad official calls attention in a letter, from which we quote the paragraph below, to a source of danger in railroad management, which is probably new to a large number of people. He says:

"To my mind one of the most important and growing dangers to life and property in connection with the operation of American railways exists in the prevailing system of contracting for cast-iron car wheels. Few people outside of wheel foundrymen have any correct idea of the dangerous character of the material used in the average wheels of today, and consequent upon the large proportion of old material used in the manufacture of new wheels, which has been increasing from year to year until the popular system in contracting wheel supplies for renewals requires the maker to receive an equal number of old wheels as in part payment for new wheels."

This correspondent suggests as a remedy for this state of things, that the responsible officers of all railroads should have a thorough expert investigation made of wheel irons, which should lead to a decision as to what irons or mixtures of iron will produce the most reliable wheel in respect to strength, regardless of cost. This information being obtained, he would have it embodied in specifications, and have all new wheels for passenger and locomotive equipment made on these specifications, and not permit a pound of old wheels to be used under any circumstances. He also suggests as a possible mixture that will give such a wheel as is required 55 per cent. of Salisbury iron for strength and 45 per cent. of Lake Superior charcoal iron for wear.

These views are unquestionably worthy of careful consideration, and doubtless the plan that he proposes would result in a great general improvement in the strength and safety of car wheels taken as a whole. We are inclined to think, however, that the measure proposed, that is, the use of new irons only, and the entire exclusion of scrap or old wheels, is hardly necessary in order to secure perfectly safe car wheels. Furthermore, we think that, although, as has been said above, the use of new irons exclusively would result in great general improvement in the wheels used in the country as a whole, yet it is entirely possible to make wheels entirely from new irons which will be as brittle and dangerous as any wheels ever made with however large a proportion of old wheels in the mixture. In other words, as we understand the matter, the strength and safety of car wheels is not entirely a question of the amount of old or scrap

wheels in them, nor of their being made exclusively of new irons, but of the chemical composition of the iron in the wheels, together with the treatment which they receive during manufacture.

In order to make this clear it will be necessary to consider for a moment the raw material from which car wheels are made, namely, pig iron. The object in this consideration is to see what it is in the car wheel that gives it strength, or on what its strength depends. Having done this with pig iron in general, we will then consider how car-wheel irons differ from other pig irons, and finally, how scrap differs from new irons, and why it should or should not be used in making car wheels.

What then is pig iron, and on what does its strength depend?

Now there are few substances artificially made as commercial products, which are so complicated in structure, and have such a variety of different chemical bodies in them as pig iron. In reality, the blast furnace in which pig iron is made may be regarded as simply a concentrator, by means of which the iron in the ores is reduced to the metallic state, and freed from a portion of the foreign substances occurring in the ores. At the same time, portions of by far the largest number of these foreign substances may be found in the iron itself as it comes out of the furnace. Pig iron is a very crude product. Ignoring traces of different elements which have been found in pig iron, the following eight substances occur in nearly all grades of this product, and have more or less influence on its quality: metallic iron, silicon, manganese, carbon, sulphur, phosphorus, slag and oxides of iron and manganese. Six or seven other chemical bodies may often be found in pig iron, but their influence, if any, is not so well understood, and the amount of them is usually so small that they are generally ignored in analysis. Of the substances first mentioned above, the iron, the silicon, and the manganese may be supposed to exist in the metallic state, possibly alloyed with each other. The carbon is believed to exist in two forms at least, as graphite and as combined with the above alloy in some form. The sulphur and the phosphorus probably exist as sulphide and phosphide of iron, possibly in the crystalline form. The slag and oxides are foreign bodies simply. Now of these various substances, the metallic iron, the manganese, the silicon and the combined carbon undoubtedly have a positive influence, either directly or through each other, on the strength of the metal. These four substances, if our conception of the constitution of pig iron is correct, are the strength-giving elements. They are the framework of the structure. The remaining substances, the graphite, the phosphide and sulphide of iron, and the slag and oxides must all be regarded as foreign bodies, which do not add anything to the strength, but are rather elements of weakness, since they interfere with the continuity of the metal. If these foreign substances could be taken out of the pig iron by means of some solvent without interfering with the metallic iron, silicon, manganese and combined carbon, as above described, there would be left a sort of metallic honey-comb, upon which in a very large degree the strength of the metal depends. Of course the honey-comb would probably not be as strong without the foreign bodies as with them, since they undoubtedly serve as supports to prevent the crushing of the walls of the honey-comb when under strain. But we cannot conceive how in any other sense they can be regarded as anything but elements of weakness. Certainly in and of themselves they have no cohesion and comparatively no strength if they did cohere, and their place in the pig iron would, so far as strength is concerned, be much better occupied with metallic iron if that were possible. If these views are correct, therefore, the strength of a piece of pig iron, so far as strength is a function of chemical composition, depends (1) negatively, on the foreign substances in the iron which must be regarded as elements of weakness, and (2) positively, on whatever affects the strength of that substance which we have for convenience called above the alloy of metallic iron, silicon, manganese, and combined carbon.

A few words now in regard to this alloy. It is probable that the mutual interactions of these four substances on each other, and the change in strength, and other physical properties resulting from change in proportions of the four substances are not fully known. And this want of knowledge undoubtedly arises partly from lack of sufficient study of this substance, and partly from the inherent difficulties of the problem. We think it safe to say, however, that there is considerable information already in possession of those best informed on the subject, and that this information is quite essential to the car-wheel manufacturer who would successfully make chilled-iron

car wheels which combine the very desirable qualities of entire safety and cheapness.

It is plain, we think, that the alloy we are discussing may be considered in two lights. First, we may regard each one of the substances in the alloy as contributing directly by its presence to the strength of the whole. That is, iron, manganese, silicon and carbon, each by themselves, have a certain strength, and when combined together the strength of the alloy is the sum of the strengths of the component parts. Second, since the iron is so largely in excess of the other constituents, we may regard the strength of the alloy as the strength of the iron modified, that is, increased or diminished, by the influence of the other substances upon it. Possibly both views are in part correct, but we think the latter is the more generally accepted one. In accordance with this view we are led to consider for a moment how the strength of the alloy is affected by the metallic manganese and silicon, and the combined carbon. Without going too much into detail, it is perhaps safe to say that as the combined carbon and manganese increase, within certain limits, the absolute strength of the alloy increases, and at the same time its capacity to suffer distortion without rupture diminishes. These are the well-known phenomena presented by the different grades of steel so largely used at present as structural materials. Few, we think, in these days would call in question the statement that as combined carbon and manganese increase in a piece of steel, the tensile strength increases and the elongation diminishes. To be sure it may be said that pig iron is not steel and that we are discussing pig iron. To which we reply that we are unable to conceive how the metallic part of pig iron, so far as that part is metallic iron, manganese, and combined carbon, differs in any respect from steel of the same composition, except in having much more silicon in it, and in having its continuity very greatly broken up by what we have termed above the "foreign substances." As we look at the matter, the honey-comb, the frame work, the strength-giving part of pig iron, is steel plus a much larger percentage of silicon than ordinary steel contains. And we do not see how, with our present knowledge, any rational conception of the constitution of pig iron can be obtained in any other way.

As to the direct influence of the silicon upon the strength and other physical properties of the alloy, not as much is known as is desirable. The amount of silicon in the metals which have been most studied is so small that its influence seems to have been somewhat masked or obscured. It used to be regarded as a very injurious substance. On the other hand, there are at present not a few indications that metallic silicon, alloyed with iron, carbon and manganese, not only does not have an injurious influence, but, on the contrary, imparts to the alloy properties which are very advantageous. To mention nothing further, there have been several cases of high silicon in steel which has shown in service remarkable endurance, while other steel of much the same grade, in exactly the same circumstances, and with less silicon, lost more metal by wear in the same time. Whatever the exact influence of silicon on the alloy under discussion, we are inclined to think it is much less injurious than has hitherto been supposed; and indeed it seems probable that in the near future it will be regarded as one of the most valuable allies to the steel metallurgist; and if these views are correct, the fact remains, that in pig iron steel containing a large amount of silicon is the substance upon which the pig iron depends for its most valuable properties.

As we have tried to explain above, it seems that the strength of pig iron is due, negatively, to the foreign substances which it contains, and, positively, to the quality of the alloy of iron, carbon, manganese and silicon which there is in it. In other words, the less foreign matter and the more of the alloy of the proper composition a pig iron contains the stronger it will be, and the more valuable for almost every purpose it will be found.

The conclusion of this discussion will be given next week.

Restricting Rates in Minnesota.

The Minnesota Legislature has several propositions before it to fix by legislation the rates of the Minnesota railroads, and most of these would make a very large reduction in the companies' rates. The demand for such legislation is said to come from the western counties of the state, which are at present thinly peopled and afford but a light traffic, but are so much further from market that the charge for transportation, even if no higher than on the railroads further east where the traffic is heavier, absorb a large part of the price of wheat in Minneapolis or Chicago, not to say on the seaboard. But unless the rates on the new western

lines where the traffic is thin are not higher than on their eastern connections, which may have ten or twenty times as much traffic, many of them will not earn their expenses. Within a few years past all the fertile parts of Minnesota have been made accessible by the construction of new railroads, which alone have made it possible to cultivate the ground in the western part of the state. One or two of the new roads have become thoroughfares leading to settlements still further west or north, and these are doubtless already quite profitable. It is doubtful whether any of the others earns the interest on its cost as yet. Some ten years ago when there was also a movement to reduce the rates in Minnesota there was but one line in the state that earned the interest in its bonds. There has been great improvement since that time, and the older roads of the state are now generally prosperous, getting as they do long hauls on the light traffic from the new western lines, as well as the increase in the traffic originating on the old lines. But it is safe to say that, with the exception of the Manitoba and the Northern Pacific, scarcely one of the new roads in the western part of the state would have been built for the profits now made on their business. They were built because the country was sure to grow and likely in the course of time to afford a traffic which would yield a good return on their cost, especially as the companies building would in many cases carry this traffic over other roads of their own for three or four hundred miles east of Minnesota. The farmers on the border almost always get their transportation done for less than cost—that is, they do not pay full interest on the cost of the new road which serves them, though its rates may be two or three or four times as high as those of roads further east. When they have ceased to be on the border, and there is settled country to the west of them, then very likely they make the railroad profitable at less than the former rates. The vast difference in cost (including interest on the investment) due to different amounts of traffic, the community generally, and farmers in particular, are very slow to see.

In 1873 the Sioux City & St. Paul road, in southwestern Minnesota and northwestern Iowa, had a traffic equivalent to 9,227 passengers and 50,600 tons of freight carried over the whole length of the road, which is equal to 12½ passengers and 69½ tons of freight carried each way daily. To have earned 6 per cent. on \$20,000 per mile of road that year it would have been necessary to make a profit averaging a little more than 2 cents for each mile a passenger or a ton was carried. The bare working expenses of the company that year were 3.06 cents for this service, say 2.71 cents per ton mile and 5.42 per passenger-mile, so that to earn 6 per cent. on this very small capital it would have been necessary to collect 7.42 cents per passenger and 4.71 per ton of freight per mile. But actually all that the road did collect was 3.76 cents per passenger-mile and 2 cents per ton-mile, and it probably charged all it could get under the circumstances; it lacked \$54,683 of earning its working expenses. This was the first year of the completed road, and it was a very bad year; but the experience of a new road on the border is likely to be somewhat similar, unless there happens to be just then a great rush of settlers over it.

In the same year the St. Paul & Sioux City road, which carried all the through traffic of the above, charging 3.96 cents per passenger and 3.50 cents per ton per mile, earned a profit of \$528 per mile—2.64 per cent. on a capital of \$20,000 per mile—its actual capital account being more than \$40,000 per mile. This road had then been open five years. It had, to be sure, made a profit 2½ times as great in some previous years, but even this was but small interest on its cost.

In the year to May 31, 1874, the net earnings of the Chicago & Northwestern's Winona & St. Peter Railroad, 327 miles, were \$97,738, or \$299 per mile, while the interest on its bonds was \$572,442.

Now, turning to an old and profitable Western road, we find that on the Chicago, Burlington & Quincy in 1870, the cost per ton per mile was about 1.06 cents, and with a profit of 0.85 cent it could pay interest on \$15,000 of bonds and 10 per cent. dividends on nearly \$20,000 of stock per mile. Thus what was a reasonably high rate on this road—a rate yielding the owners an excellent profit on their investment—would not have paid the bare cost on the new Minnesota roads, which needed three times the Burlington's rates in order to pay a very low rate of interest on their cost. But instead of an average of 12½ passengers and 69½ tons of freight each way daily, as on the Sioux City & St. Paul, the Burlington that year had 90 passengers and 452 tons of freight. Evidently there would have been no justice in judging of the reasonableness of the rates on the Minnesota roads by the result of the

lower rates of the Chicago, Burlington & Quincy; there would have been about as little in adjusting the rates on some of the Burlington's branches to those of its main line or the average of its system. Probably then the cost on some of its newer branches was several times as great as the average, and the highest rates attainable scarcely paid any interest on the cost of the branches with the thinnest traffic.

We have not reports for late years of the earnings and expenses of the new lines in Western Minnesota, these being all built by the old companies, and usually forming part of older lines, and having, in the published reports of the companies, their earnings and expenses confounded with those of systems, some of which consist of some thousands of miles of road situated in several states. Some of them doubtless have been doing extremely well for new roads; but we doubt if there is one, save the Northern Pacific and the Manitoba, which has yet earned a profit equal to full interest on its cost. The companies have taken the chances of the future development of the country and profitability of the traffic, and they are not likely to be disappointed in the final result, though how soon they have the reward for their enterprise will depend upon circumstances, some of which cannot be foreseen, among which is the ability to charge a paying rate.

It is frequently (perhaps generally) the case that a country lacking railroads welcomes them on any terms and has not the least disposition to submit them to any restrictions. The fact is that the western Minnesota prairies have been increased in market value from almost nothing to \$10 or more by the construction of roads which must charge high rates for some years if they make any returns to their owners. There are single counties in Minnesota in which the value of the land (excluding all other improvements) has been increased \$2,000,000 or more within three or four years simply by the construction of railroads which made them easily accessible. Now that the roads are built the present land owners desire still further to increase the value of their lands by reducing the price of transportation on the railroads that alone have made it possible for them to live where they do, and in many cases they aim to do this when the reduction will deprive the railroad of a fair income on the capital invested in it—perhaps of the whole profit of the new road. It is to be said for them that the larger number of them did not get the benefit of the whole rise in the value of the land covered by the construction of the railroad, having bought it after the railroad was built, so that they do not personally feel the whole of the benefit which the railroad has conferred on the country in which they live; and it is to be said, further, that they find the rates on their end of the road much higher than on some lines further east which are evidently prosperous, and they do not sufficiently appreciate the difference, both in cost of transportation and in the interest account, per unit of traffic caused by differences in the bulk of traffic, nor see that to pay a low rate of interest on the cost of their cheap road may of itself require twice the rates which yield a good profit in a busy road. The fact that the new roads are now all parts of great systems, and that there are no reports of the business of the different parts, but only of the whole system, makes it difficult to show them this difference plainly. The companies will probably be unwilling to report the business of their new lines separately, because they would show such small profits that their credit and the prices of their securities might be hurt. While the farmers misapprehend the position of the new roads in one way, investors do in another. A line two or three years old which does not earn full interest on its cost, they are likely to consider a burden, when it may be sure to make profits so large a little later as to make up for lost time and pay well for waiting. Thus, between the granger who complains that the road earns too much and the stockholder who would be frightened if he knew how little it earned, the railroad management is in a delicate position.

The propositions before the Legislature prescribe fixed maximum rates so low that there could be no modification of them to suit circumstances, which is a fatal objection to any tariff. Some of the proposed rates would starve to death every railroad in Minnesota. One makes the rate for the great bulk of Minnesota freight ½ cent per ton per mile for distances over 70 miles; another allows 1 cent per ton per mile on grain, etc., for distances over 300 miles, but allows only ½ cent on lumber and fuel for distances over 100 miles. Of course it is not possible to say what the average rate would be, but for roads like the Northern Pacific and the Manitoba, there is a haul of 200 miles and more on by far the larger part of their freight. On the Northern Pacific in the year to June 30, 1881, the average expense per ton per mile was about 1.40 cents;

on the Manitoba, 1.21; on the Minneapolis & St. Louis, 1.12; on the St. Paul & Omaha, 0.97 cent, on the whole system of the Milwaukee & St. Paul, in the calendar year 1881, about 1.06 cents; on the Chicago & Northwestern, in the year to May 31 last, about 0.80 cent. The two last named roads have lines with heavy traffic out of Minnesota on which the expense must be very much less than the average, and certainly not half as great as on their newer Minnesota lines.

The state of Minnesota has a Railroad Commissioner, and if the roads where the people complain of the rates are making extravagant profits he ought to be able to investigate and find it out, and tell whether the people who live on the western half of the Southern Minnesota, the Winona & St. Peter, the St. Paul & Omaha, the Hastings and Dakota, and the lines in the Red River valley are paying an extortionate rate of interest on the cost of the lines which serve them. But to reduce the rates on these lines because the companies which own them have elsewhere in Minnesota or out of it some other lines which pay well will certainly be most unjust. It has been necessary to wait ten years before getting a profit from some of the Minnesota roads, and the owners are entitled to a large one because of the delay, and certainly should not be compelled to accept a reduction of the income from their latest investments in the state when that income as yet pays but a very small interest.

Pennsylvania Railroad Earnings and Expenses.

We now have the statement of the earnings and expenses of the Pennsylvania Railroad for the month of December, completing the company's year. In that month the gross earnings of the lines east of Pittsburgh and Erie were \$425,418 (11½ per cent.) more than in the previous year, the working expenses were \$443,757 (17½ per cent.) more, and the net earnings \$18,339 (1½ per cent.) less. For ten successive years the gross and net earnings and working expenses in December have been:

Year:	Gross earnings.	Expenses.	Net earnings.
1873.....	\$2,955,768	\$1,925,091	\$1,030,777
1874.....	3,087,115	1,838,498	1,248,619
1875.....	2,801,171	1,521,555	1,279,616
1876.....	3,082,567	1,710,408	1,372,159
1877.....	2,841,392	1,641,786	1,199,606
1878.....	2,905,297	1,673,363	1,231,934
1879.....	3,453,924	1,941,870	1,512,054
1880.....	3,477,828	2,421,576	1,056,252
1881.....	3,731,840	2,528,569	1,203,271
1882.....	4,157,238	2,972,336	1,184,902

The statement for this year is chiefly remarkable for the extraordinarily large working expense. These were not only much larger than in any previous December, but larger also than in any other month of any year. In August last the gross earnings were \$514,000 more, but the expenses were then \$334,000 less; the gross earnings were greater in each of the four months next previous, but the expenses on the average then were \$295,000 less. It should be said, however, that in each of the past three years the expenses have been larger in December than in any other month.

The gross earnings in December were very large, but the increase over the previous year was less than in any previous month since July. The increase in each of the last six months has been:

July.	August.	Sept.	Oct.	Nov.	Dec.
\$368,732	\$861,201	\$682,596	\$967,082	\$533,610	\$425,418

It would seem that the increase in the grain and other traffic which made the earnings of some of the roads east of Chicago exceptionally large in December had less effect on this road, or were counterbalanced by less activity in some other traffic, which latter is quite probable. Usually earnings are less in December than in the fall months. Last month the decrease from November was \$216,600; the year before it was \$108,400; in 1880, \$27,100. It is not great enough to be particularly significant in the absence of any knowledge of the particular kinds of traffic affected.

So great is the increase in expenses that though the gross earnings were much larger than in any previous December the net earnings were smaller than in any other for ten years except 1880, 1878 and 1873. The decrease from 1881 is but trifling, however. The ratio of expenses to earnings was 71.15 per cent. in 1882, against 67.8 in 1881, 68.3 in 1880 and 56.2 in 1879.

The lines west of Pittsburgh and Erie in December show a surplus of \$58,737 over interest, rentals, etc., which is a gain of \$173,706 over 1881, when there was a loss of \$114,969 on these lines. The profits of the Pennsylvania Railroad Company, from the two systems, was therefore \$155,367 more in 1882 than in 1881.

We made a considerable error in stating the profits of these Western lines in reviewing the statement for November, the figures which we gave for that month (\$922,347), being really the profits of the two months of October and November, of which more than two-thirds was made in October. The conclusion drawn as to

the condition of Western traffic in November was thus erroneous and more nearly applicable to October than November. The profit on these lines in December for four years has been reported as follows:

1879.	1880.	1881.	1882.
\$541,302	\$163,039	\$114,969 (Loss.)	\$58,737

The loss or profit on these lines is usually but a very small proportion of their net earnings.

For the year ending with January the earnings and expenses of the lines east of Pittsburgh and Erie compare as follows:

1882.	1881.	Increase.	P. c.
Gross earnings, \$49,079,633	\$44,124,182	\$4,955,451	11.2
Expenses, 30,647,204	26,709,809	3,937,395	14.7
Net earnings, \$18,432,429	\$17,414,373	\$1,018,056	5.8

The large gain in the earnings even after the very great increase in expenses gave an increase of more than a million in net earnings—about 1½ per cent. on the present stock of the company. The gross and net earnings and expenses for ten successive years have been:

Year.	Miles worked.	Gross earnings.	Expenses.	Net earnings.
1873.....	1,530	\$39,983,139	\$26,783,587	\$13,199,552
1874.....	1,538	37,386,427	23,011,749	14,374,678
1875.....	1,566	34,494,104	21,094,461	13,399,643
1876.....	1,624	36,891,061	22,081,229	14,809,832
1877.....	1,716	31,117,146	19,028,467	12,088,679
1878.....	1,716	31,636,734	18,408,993	13,227,741
1879.....	1,806	34,620,279	20,382,740	14,237,539
1880.....	1,810	41,260,072	24,625,047	16,635,025
1881.....	1,845	44,124,182	26,709,809	17,414,373
1882.....	1,890	49,079,633	30,647,204	18,432,429

We see here that the gain over 1881 gives little idea of the recent great growth in the earnings of this road, because in 1881, in spite of the railroad war, its earnings were much greater than ever before. The increase in gross earnings is 19 per cent. over 1880, 42 per cent. over 1879, and 55 per cent. over 1878. Not many roads in new country even can show a more rapid growth, and the other trunk lines cannot compare with it. And the increase has been made with but small increase of mileage, and that in not very important branches.

The increase in expenses, however, has been at a still greater rate; they were last year nearly 25 per cent. greater than in 1880, 50 per cent. greater than in 1879, and 66½ per cent. greater than in 1878. Of the \$17,400,000 gain in earnings since the last named year, \$12,200,000 went for expenses, and the ratio of expenses to earnings increased from 58.4 to 62.4 per cent.; a change involving nearly \$2,000,000.

The net earnings were also larger last year than ever before, but the gain in these is comparatively moderate—11 per cent. over 1880, 29½ over 1879, and 40 per cent. over 1878—great increases truly, and moderate only in comparison with the truly enormous gains in gross earnings. In these years everything has favored the local traffic of the Pennsylvania Railroad, and as regards through traffic it has shared with the other trunk lines, the business fluctuating in amount and still more in profitability. It was not so large last year as in some others, and certainly not so profitable. In the first half of the year the through traffic eastward was unusually light, and for two months quite unprofitable, while the west-bound was large and entirely unprofitable. In the second half of the year the whole through traffic was reasonably large and reasonably profitable. The change may be seen in the variation of the earnings and profits in the two halves of the year, as follows:

	1879.	1880.	1881.	1882.
1st half.....	\$15,414,058	\$19,431,071	\$21,553,839	\$22,650,863
2d half.....	19,506,221	21,890,001	22,570,443	25,438,780
P. c. in 2d half.....	55.5	52.9	51.1	55.6
Net earnings:				
1st half.....	\$5,845,655	\$8,094,409	\$8,097,154	\$8,189,919
2d half.....	8,391,584	8,545,616	8,417,219	10,242,510
P. c. in 2d half.....	59.0	51.4	48.3	55.6

In every year (since 1876 at least) except 1881 more than half the net earnings were made in the last half of the year. That was a very bad half-year then; it was much the best ever known in 1882. If it indicates fairly the whole crop year, then the first half of 1883 should be very profitable for this road. It in all probability will be much more profitable than the first half of last year. The condition of the coal and iron and other manufacturing business has more to do with it than the crop movement.

The surplus over all liabilities for interest, rentals, etc., of the lines west of Pittsburgh and Erie was \$723,973 less in 1882 than 1881, and allowing for this we have the Pennsylvania Railroad Company's profits from the two systems but \$224,083 larger in 1882—little more than 1 per cent. When we remember that no longer ago than Sept. 1, the profits of the two systems were \$1,717,000 less than in 1881, we see what a great and favorable change has been caused in the last four months. At the end of June, the profits of the Western system were \$1,604,010 less than the year before, and the net earnings of the Eastern system \$807,235 less. At that time it seemed altogether improbable that the profits of the year could be nearly so large as in 1881. But in the last half of 1882 the profits of the Western system were \$2,045,072, against \$1,075,035 in

1881, and this with the gain in net earnings in the Eastern system made the profits as large last year as the year before, both years being made up of one bad and very good half-year.

The profits (or losses) of the lines west of Pittsburgh and Erie for eight successive years have been:

Year.	Profit.	Year.	Profit.
1875.....	\$679,292	1879.....	\$1,682,323
1876.....	35,854	1880.....	3,071,397
1877.....	114,128	1881.....	2,648,338
1878.....	710,530	1882.....	1,924,365

These vary so greatly because the liabilities on account of the lines absorb by far the larger part of the net earnings even in the favorable years—more than 80 per cent. in 1880, when the profits were largest. A comparatively small increase or decrease in net earnings, therefore, makes a great difference in the profits of the Pennsylvania Railroad Company.

The profits of these two systems, it should be observed, do not form the total profits of the Pennsylvania Railroad Company, by any means. It has the income of its vast investments in other railroads, some of them leased lines, and some, like the Northern Central and the Philadelphia, Wilmington & Baltimore, worked and reported separately. The income from these investments in stocks and bonds varies greatly from year to year; it was about \$3,200,000 in 1881, has been as much as \$4,300,000 (in 1875), and as little as \$1,800,000 (in 1878). Among these investments are nearly \$11,000,000 of Philadelphia, Wilmington & Baltimore stock, which pays 8 per cent., and probably had an unusually profitable business last year, owing to the heavy passenger traffic; and \$2,400,000 of Northern Central stock, on which no dividends were paid for three years before 1880, 2½ per cent. in 1880, 6 in 1881, and 8 per cent. last year.

It is therefore probable that 1882 was an extraordinarily prosperous year for the Pennsylvania Railroad Company. In 1881, after paying 8 per cent. dividends and all charges a balance of profits amounting to about \$2,200,000 was shown. The stock was smaller then, however, and the dividend payments amounted to but \$5,861,718. Last year the first dividend of 4 per cent. required \$3,107,000, and the stock was then increased 10 per cent. The second dividend of 2 per cent. cash then required \$1,675,700; with it was paid a dividend of 2½ per cent. in scrip convertible into stock, and as this will represent expenditures on capital account paid out of earnings, we may assume that \$2,094,600 more of the profits were so absorbed, making the total dividends of the year \$6,877,000, or a million more than the year before. The increase of stock by the last dividend brings up the total to \$86,081,000, to pay 8 per cent. on which will require \$6,886,500—about the same as was paid last year (when the dividends were 8½ per cent.) and a million more than in 1881. The extraordinarily large working expenses indicate that they covered some work properly chargeable to construction, rather than the reverse. It is important that this company should pursue a conservative course in prosperous times, because it suffers the decrease in profits of such an enormous system of railroads besides that which it owns in bad times. This too makes it advisable that the new capital required should be raised, so far as possible, by new stock instead of bonds. With the larger stock, of course, the certainty of large dividends is lessened, but the financial strength of the company is much greater than if bonds had been issued. Its credit is now excellent, and all its recent loans have been at a very low rate of interest, and as bonds mature its interest charges are reduced; but this is a result of limiting the funded debt and similar obligations, and not a cause for increasing them. The improvement in value of the leased lines is, however, in all probability permanent; not that they may not sometime be less profitable than in the last three years, but that they are never likely to be as unprofitable as in some of the years before 1878. The Northern Central and the Philadelphia & Erie are always likely to be much better properties than formerly; and some of the Western lines are likely to do better in the worst of years hereafter than in several of the years after 1873, though we cannot say what may be done at some future time by the multiplication of competing roads.

The Political Economy of Railroads.*

I.

The books and pamphlets which have been written, treating of the "Railroad Question," are innumerable. No one has, however, treated it so thoroughly, systematically and scientifically as Dr. Sax, in his work on transportation economics. Dr. Sax is a well-known Austrian authority on railroads, in their relations to the public, and is held in high respect in all countries of Europe, both by those who agree and those who disagree with his conclusions.

* Die Verkehrsmittel in Volks- und Staatswirtschaft, von Dr. Emil Sax. 2 Bände. Wien, 1878-79. (The Means of Communication Considered from a Politico-Economic Standpoint, by Dr. Emil Sax. 2 vols. Vienna, 1878-79).

In this work, the most salient parts of which we are about to describe, he has set out with the distinctly-formed purpose of treating exhaustively what may be called the public or economic side of the different means of transporting or carrying goods, commodities, persons and news. The author has written his work to favor no class or party, but with a view to furnishing all interested in any way in the different means of communication a satisfactory basis for a scientific and practical solution of the "question" now agitating the public in regard to railroads, the telegraph, canals, etc.

One objection to the "Verkehrsmittel," is its length. It consists of two volumes, containing nearly one thousand large octavo pages. In his effort to make his work complete, Dr. Sax describes not only what is but what might have been under conditions which do not exist. Thus in one place he describes what the situation of different countries would be to-day provided no railroads existed. On the other hand, there is a fullness and philosophical completeness about German works, exhibited by no others, and Dr. Sax's book if not approached in completeness by any other work in any language which treats of its subject.

The first volume of Dr. Sax's work treats of the general economic principles and consequences of the means of communication, of highways or ordinary roads on streets, of water-ways, i. e., canals, rivers, lakes, oceans, of the post and finally of the telegraph. The second and larger volume treats of railroads. The first volume is of less importance, as it contains comparatively little which is not known and agreed to by all. In the following article we purpose not to criticize but to describe this work—to state concisely, so far as possible in the space, what the author has stated at length in his two volumes. It will be understood, then, that for the most part, it is not necessarily the views of the *Railroad Gazette*, but those of Dr. Sax, which are expressed. We will briefly indicate the line of argument and important points of the first volume, and then describe the second more at length.

The first division of Vol. I. contains an interesting account of the economic effects of an improvement in the methods of transportation. First, he notes that one element of the cost of producing an article is the expense of bringing it to the consumer. The cost of producing wheat for me in Paris, is the cost of raising it in Iowa plus the cost of transporting it from there to me in said city. As means of transportation are improved, one element of production becomes cheaper, and other things being equal, the price of commodities is reduced. Secondly, the market of a commodity produced in a given place increases in size, not directly as the means of transportation are improved, but in the same ratio in which a circle is increased by prolonging its radius, that is, as the square of the radius. This is an interesting and important point. If an article will bear transporting 25 miles, it can be sent north as well as south, east as well as west; in other words, the market of the article is a circle with a radius of 25 miles. If the improvement in carrying freight or merchandise enables us to send the article 50 miles, and sell it, its market becomes a circle whose radius is 50 miles; that is, the second market is four times as large as the first.

The next consequence of better means of communication is an increased stability of prices. The producer sells his goods where they are at any given time the dearest, whereas the buyer purchases where they are the cheapest. The effect is to equalize prices in different places.

If we examine the effect produced by better means of transportation on different commodities, we shall discover that it is inversely as the value of the goods in exchange. The smaller the value of the article, the more marked the effects of improvements in the manner of bringing it to market. We have seen that transportation is one part of the cost of production, but as goods decrease in value, the relative cost of this element of production increases. In former times, only goods of high value, relatively to their volume and weight, were objects of commerce between different countries.

In the fifth place we observe an increased production as the cost of transportation decreases. This results from the increased demand and consumption in consequence of greater cheapness. The manner of production changes at the same time. Large manufacturing establishments and factories take the place of small shops, conducted by an artisan employing one or two journeymen and a few apprentices. A division of labor takes place in two ways: first, in manufacturing any one commodity, each laborer performing only a small part of the labor expended on one article; secondly, between different cities, states and countries. Some place has great natural or artificial advantages for producing a certain ware, and on account of the cheapness of transportation is able to undersell manufacturers in other places. Industries are carried on on a large scale; a tendency to the accumulation of capital in a few hands becomes apparent.

The wages of laborers become more equal in different parts of the world, as also the rent of land. The straits to which agricultural classes in Europe are reduced is the result of American competition, which, in turn, is a consequence of cheap freights. Emigration and immigration, going on so extensively now, are equalizing wages in different parts of the world.

The improvement in the means of communication is also a powerful force in advancing the civilization and culture of the world.

THE PROVINCE OF GOVERNMENT AS REGARDS THE MEANS OF COMMUNICATION.

The sphere of government differs with time and place, and no questions relating thereto can be answered absolutely. Dr. Sax, however, lays down three rules with respect to the activity of government. These rules, framed by Professor

Knies, of Heidelberg, although taking full account of the relativity of problems concerning governmental action, serve as clues for solving concrete questions as they arise.

The state should satisfy those needs and wants of the public

1. Which private people cannot satisfy, but which it can.
2. Which private people do not satisfy, although they might if they would.

3. Which private individuals ought not to satisfy, even if they are willing to do so, because the necessary suppositions for the success of private industry are wanting or are unallowable.

It is clear, therefore, that to justify or condemn the position taken by government with reference to the means of communication, it is necessary, first, to examine the circumstances of time and place. It is folly, for example, to say unconditionally that government should or should not build and manage railroads.

If we go back in history we shall find that in the beginning of economic life and activity, to carry goods, persons and news was entirely a private business. As commerce and wealth develop and the power of the state increases, government finds it necessary to supply at least a part of the needs of the public in the way of means of communication. From the most ancient times roads and canals have been built by the state. This is case number one. With the increase of private wealth, it is often followed by case number two. Thus the state post frequently undertook to carry persons and things, because private individuals did not offer to perform the service.

To-day private capital and the spirit of enterprise on the part of private persons are strong enough to furnish all means of communication. Ought they to do it? In deciding this question we must consider that the principle of economy demands that monopoly should be the rule in transportation. It is only in this way that the enormous amount of capital in ways, streets and roads, etc., of various kinds can be made to yield the largest returns. Where two roads are employed to render the service which might be fulfilled by one, the world loses the amount of capital needlessly expended. But while monopoly is desirable and competition is wasteful, monopoly uncontrolled is dangerous to the production and exchange of goods. Services must be rendered to all under the same conditions. It is necessary that a certain state control should take place. So far as the price is concerned, the private carrier, in order to use as profitably as possible his fixed capital, will continue to reduce the price of transportation so long as increased business compensates for low rates. If the public interest demands still lower rates, private enterprise has played out its rôle. Wherever this happens, it becomes the duty of government to serve the public. The means of communication are of such enormous importance to the entire economic and public life of a nation that the case described frequently occurs.* It also happens sometimes that a road is of great importance to the whole, where a private person would not feel warranted in building it.

Unity of plan in building ways is a demand of political economy, as only thus can the greatest number of purposes be accomplished with the least cost. Canals, railroads and streets must be built so to form one great net-work. The interests of any one line or way must be subordinate to the whole. Now this unity of organization can be brought about only by the state. It does not follow, however, that the central government should build and manage all kinds of roads. Local self-government is to be encouraged. Streets and railroads chiefly of local importance may be built or managed by that part of the state mainly interested, restricted only in those respects which are of importance to a greater division of the commonwealth.

There are also two ways in which public interests may be cared for; first, by a direct administration of the state; secondly, by an administration delegated by the state.

A railroad company is an example of delegated administration. A railroad is not and should not be entirely a private undertaking. The conditions under which railroads are built and managed show their public nature. In consideration of this nature the right of expropriation is granted to them, and subventions are frequently granted to aid in establishing railroads. Restrictions, too, are imposed upon them on the same principle; as that they should serve all upon the same terms, and that the lines should be so laid and managed as to meet public needs. When necessary, rates should be established by law, with due regard to the interests of the public. It is because people have given so little attention to the development—theoretical and practical—of delegated administration, says Dr. Sax, that the "railroad question" is giving so much trouble in all countries. Some, not clearly recognizing that the authority of railroad companies is only delegated by the state, hesitate to impose upon them needful restrictions; others, for the same reason, fail to see how the public interests are to be properly guarded and promoted otherwise than by state railroads. It is advisable to delegate authority and let private parties manage railroads whenever, in the concrete case, the principles of economy are better realized than by a direct administration and control on the part of the state.

There are three principles according to which public needs may be satisfied:

1. They may be provided for without special charge to the individual enjoying the institution or the use of the property, as in case of public parks, public highways and free schools. These are paid for by taxes.

2. In the second case, provision is made for the wants of the public by what the Germans call a "public institution"

(öffentliche Anstalt). A fee (Gebühr) is required for the use of the institution, but it is not calculated to make money out of it. If the receipts exceed the expenditures, this surplus is to be regarded as a tax; if they are less, the institution partakes in so far of the character of a "free good." Such institutions are regarded as of no importance to the general public, but of especial value to those who use them. It is, therefore, considered just that the latter should pay more than others for their maintenance. A toll for the use of a highway is an example.

3. General needs of the citizens of a state may be satisfied by a "public undertaking" (öffentliche Unternehmung). Such an undertaking is intended to make money, and may be managed by the state as well as by private individuals. A railroad is an example, inasmuch as even government should manage railroads in their early history so as to make money out of them. It is only in case number three that delegated (and regulated) administration is possible. In some respects state administration is superior. A state can conduct such an undertaking at a loss for a long time with a view to its becoming "paying" later on.* Government will take into consideration the effect of the price on the general public welfare, and, in some cases, gradually change the nature of the administration until it becomes only a self-supporting service.

The Administration of Railroads.—There is no question between private and state industry here. As we have seen, railroad companies where they partake most of a private nature, are more or less free administrators of public undertakings.

Railroads are removed from the sphere of pure private economy on account of the enormous amount of fixed capital they represent and their peculiar character and importance to the people as a whole; further, on account of their character as monopolies and their importance as an instrument in promoting the general welfare and in the administration of the state; fourthly, on account of the necessity of unity in organization as a condition of their most fruitful activity.

[TO BE CONTINUED.]

British Rail Exports and American Consumption.

British rail exports during 1882 were the largest for many years, 9 per cent. more than in 1881, and 29 per cent. more than in 1880. This was in spite of smaller exports to this country, the exports having been for the three years:

	1880.	1881.	1882.
To the United States:			
Iron.....	108,061	96,139	21,135
Steel.....	113,214	194,001	173,876
Total.....	221,275	290,140	195,011
To other Countries:			
Iron.....	38,842	24,082	25,307
Steel.....	345,973	401,510	500,043
Total.....	384,815	425,592	525,350

The decrease in exports to this country of 95,129 tons (33 per cent.) from 1881 is much more than counterbalanced by the increase of 159,848 tons (38 per cent.) in exports to other countries, where there seems to have been more railroad building than usual, at least in those countries which do not make their own rails or a large part of them. These exports to other countries were enough for 6,655 miles of track laid with 56 lbs. rails last year, against 4,836 in 1881 and 4,373 miles in 1880. Of course the rails were not all used for new roads, however. Most of them, doubtless, were for renewals. But the larger exports indicate that in other countries as well as here railroad construction has been unusually active for the past two years. We know it to have been so in Mexico, which gets its rails exclusively from England, or nearly so; but the Board of Trade report continues to lump Mexico with the unspecified "all other countries," though it has now become a much more important customer for rails than most of the European countries. Canada has not taken so many rails as might have been expected. The exports of both steel and iron rails to Canada and to the unspecified "other countries" have been:

	1880.	1881.	1882.
Canada.....	82,341	104,737	89,985
Other countries.....	66,905	96,649	181,999

Canada thus took 14 per cent. less rails last year than the year before; but the unspecified countries took 85,350 tons (88 per cent.) more than in 1881, and 115,094 tons (172 per cent.) more than in 1880. This gain is more than the total increase of British exports from 1881 to 1882, and two-thirds of that from 1880 to 1882.

The British exports to European countries have now become inconsiderable. Time was when England was the chief source of supply to all of them except Belgium. Germany, with its 21,300 miles of railroad, took but 80 tons of British rails last year, and it exports considerable amounts to adjacent countries.

Neither France (with 17,100 miles of road) nor Austria-Hungary (with 11,900 miles) appear on the list, and if they are among the unspecified countries, it must be because their exports to them are insignificant. To all named European countries—Russia, Sweden and Norway, Germany, Spain and Italy—the exports have been:

	1880.	1881.	1882.
Tons.....	40,711	50,242	92,530

These countries together have about 51,000 miles of railroad, so that these exports can be but a small portion of the rails used for renewals, to say nothing of new construction. One-half of the whole was taken by Italy in 1880 and 1881, and three-fourths (71,133 tons) in 1882, and at the beginning of the latter year it had but 5,450 miles of road. Thus we have the other countries named, with 45,500 miles of road, taking but 16,246, 25,178 and 21,397 tons of rails in each of the three years successively—not half a ton per mile

* Not a single Prussian railroad paid at first; but afterwards some became very valuable property.

of road; which shows to how small an extent they depend on Great Britain for rails now.

America and the British dependencies in India and Australia are now the only important market for British rails. They took 505,922 tons of the total 780,451 exported in 1882, besides the portion of the 181,999 to unnamed countries which went to America, which was probably most of it. India last year took 87,511 tons—nearly as much as Canada; Australia, 80,930 tons. The only South American customer of importance is Brazil, which last year took 45,639 tons—not one-fourth as much as the United States and but half as much as Canada, but nearly half as much as all Europe.

We, however, are chiefly interested in the exports to this country. The statement that they fell off one-third from the exports of 1881 does not sufficiently show the course of the business. Early in the year the exports to the United States were unusually large, and at the end of April the total for the four months was larger than in 1881, and nearly one-half larger than in 1880. They became decidedly small after August, and for the last four months of the year they were but 41,787 tons, against 57,494 in 1881 and 60,829 in 1880. The exports of the last two months have been less than those of any other consecutive two months since August, 1879, when rail exports first began to revive. For successive half-years our takings from Great Britain have been, for four years:

	1879.	1880.	1881.	1882.
First half.....	7,730	125,578	157,824	122,861
Second half.....	30,840	93,607	132,316	72,210
Per cent. in last half.	82.7	42.7	45.6	37.0

At the beginning of 1879 the price of steel rails in this country was about \$42 at the mills. During the previous year our total imports had been but nine tons. In the first half of 1879 prices were low and imports insignificant, but by August the demand for rails had developed so that the home works were enabled to supply it, and prices went up very rapidly, and at the beginning of 1880 steel rails were \$70 per ton, and six months later they were quoted at \$85. Of course this high price brought large importations. By the end of 1880 the prices had fallen to \$50, but they were pretty steady at that price through 1881, and at the beginning of 1882 were still quoted at \$58 to \$60. They had fallen to \$50 in the middle of this year, and at its close were \$40, while there had been some sales at \$39. At \$50 it must be unprofitable to import rails, and this sufficiently explains the falling-off in British exports to this country of late. If the rails that were shipped in the last half of the year had not been ordered some time beforehand, there would probably have been no imports since last June, and at least none since September.

It is notable that this falling off in prices and imports has taken place in the year when railroad construction was the greatest ever known in any country. But by the beginning of the year, the works of the country had greatly increased their capacity, and long before the close of the year, though rails were going down on new road at a tremendous rate, there was a great reduction in the orders for future delivery, and at the present time the capacity of the home works seems fully sufficient to supply the whole demand, although the consumption of iron rails has ceased.

This latter—the great reduction in the consumption of iron rails in the years of the greatest total rail consumption—is one of the notable features of the past year. We have seen above how the importations of iron rails fell off nearly four fifths in 1882. The manufacture fell off also, and the imports and manufacture together were about 271,000 tons in 1882, against 532,000 in 1881 and 546,920 in 1880. As prices are now, iron rails will hardly be used. But notwithstanding the great decrease in our importations of iron rails in 1882, we were still the chief takers of British iron rails—indeed, we took 45 per cent. of the total British exports. Other countries, however, had given up importing iron rails before. In 1880 we took nearly as much iron as steel from Great Britain, other countries, one ninth as much; in 1881 our imports of iron were one half those of steel, other countries took 17 tons of steel to one of iron. Last year, we took 8½ tons of steel to one of iron; other countries, 23 to 1. The manufacture has not decreased in the same proportion as the imports, however. One ton of rails was made here to 1.96 of steel in 1880, 1 to 2.77 in 1881, and 1 to 6 in 1882. The figures for 1882 are not exact, but are nearly correct.

It thus appears that iron rails now are little used, and are used less every year. If prices had been as low in the whole of 1882 as in the last month or two, probably iron rails would hardly have been made at all. Apparently, in a very few years American railroads will be substantially all steel.

Record of New Railroad Construction.

This number of the Railroad Gazette contains information of the laying of track on new railroads as follows:

Northern Pacific.—Track on the Fergus Falls Branch is reported laid from Wahpeton, Dak., west by south 40 miles.

Sanborn, Cooperstown & Turtle Mountain.—Track laid from Sanborn, Dak., north 15 miles.

This is a total of 55 miles, making 10,579 miles so far reported for 1882.

New track is reported laid in the present year as follows: **Atlantic & Pacific.**—Extended from Yampai, Ar., westward 12½ miles.

Central Iowa.—The Peoria & Farmington Division is extended from Phelps, Ill., west to Monmouth, 5 miles.

Chicago, Burlington & Quincy.—The Clinton Branch is extended from East Clinton, Ill., north to Fulton, 2 miles.

* The post-office in the United States, for example.

RAILROAD EARNINGS IN DECEMBER.

NAME OF ROAD.	MILEAGE.					EARNINGS.					EARNINGS PER MILE.				
	1882.	1881.	Inc.	Dec.	P. c.	1882.	1881.	Increase.	Decrease.	P. c.	1882.	1881.	Inc.	Dec.	P. c.
Ala. Gt. Southern	290	290				\$ 94,770	\$ 86,897	7,873		9.1	\$ 327	\$ 299	28		9.1
Bur. Ced. Rep. & No.	690	570	120		21.1	246,062	232,612	13,450		5.7	357	408		51	12.7
Central Iowa	244	244				102,229	120,122			14.9	419	492		73	14.9
Central Pacific	3,170	2,775	395		14.1	1,068,000	2,225,179			11.5	611	802		191	23.9
Chicago & Alton	847	847				680,323	646,812	33,511		5.1	802	764		38	5.1
Chi. & Eastern Ill.	245	232	13		5.7	135,783	153,113			11.3	559	660		101	16.1
Chi. Mil. & St. Paul	4,450	4,100	350		8.5	1,064,000	1,854,289			5.9	441	452		11	2.4
Chi. & Northwestern	3,460	3,010	450		14.9	1,718,384	1,855,477			7.4	497	616		119	19.8
Chi., St. P., M. & O.	1,150	960	190		19.8	375,701	432,615			13.1	327	451		124	27.5
Char., Col. & Aug.	308	308				76,072	69,972	7,000		10.0	250	227		23	10.0
Cin., Ind., St. L. & Chi.	384	342	42		12.3	180,951	195,809			5.853	30	495		78	13.7
Cin., N. O. & T. Pac.	536	334				208,814	236,599			11.7	621	704		83	11.7
Cleve., Akron & Col.	144	144				39,075	37,974	1,101		4.5	276	264		12	4.5
Columbia & Green Bay	296	296				97,537	82,645	14,892		18.0	329	279		50	18.0
Col. Rock's V. & Tol.	320	320				240,555	261,229			7.9	752	818		66	7.9
Denver & R. G.	1,169	1,062	98		9.2	443,000	626,728			20.3	382	590		208	35.3
Des M. & Ft. Dodge	108	84	24		28.6	25,410	35,286			19.5	263	420		157	37.4
Det., Lan. & Nor.	226	226				125,813	122,141	3,672		3.0	557	540		17	3.0
Eastern	284	284				249,391	248,308	1,083		0.4	878	874		4	0.4
E. Tenn., Va. & Ga.	900	900				338,687	302,957	35,730		11.8	376	339		40	11.8
Evansv. & T. H.	146	146				54,876	52,705	2,171		4.1	376	361		15	4.1
Flint & Pere Mar.	345	318	27		8.5	206,168	168,820	37,348		22.1	598	531		67	12.5
G. N. B. Wn. & St. P.	220	220				108,611	160,093			13.7	173	200		27	13.7
Gulf. Col. & S. F.	483	370	113		30.5	241,447	140,068	101,379		72.4	500	379		121	31.0
Hannibal & St. Jo.	292	292				230,891	194,336	45,555		23.5	822	665		157	23.5
Houston, E. & W. Tex.	104	88	16		18.2	26,071	21,842	4,229		19.2	251	248		3	1.2
Houston & Tex. Cen.	522	522				430,185	376,877	53,308		14.1	824	722		102	14.1
Ill. Cen. Ill. lines	930	918	12		1.3	543,097	583,055			6.3	584	635		51	8.6
Iowa lines	402	402				153,931	180,390			14.6	383	449		66	14.6
Ind. Bloom. & West.	685	555	140		25.2	205,211	192,622	12,589		6.5	295	347		52	14.8
Kan. City, F. Scott & G.	300	320	40		12.5	168,611	160,093	8,518		5.3	468	500		32	6.4
Lake Erie & Western	388	388				108,117	108,117	16,358		15.1	322	280		42	15.1
Little Rock & Ft. S.	108	108				80,071	62,932	17,138		27.2	477	375		102	27.2
Little R., Miss. R. & T.	173	158	17		10.9	45,701	33,494	12,206		39.2	264	214		50	23.8
Long Island	354	353	10		5.8	156,808	137,015	19,793		14.5	443	409		34	8.4
Louisville & Nash.	2,025	2,025				1,221,211	1,153,779	67,432		5.8	603	570		33	5.8
Mar. Hought. & Ont.	97	88	9		10.2	23,001	19,000	4,000		21.1	237	218		19	8.7
Memphis & Charles.	292	292				146,447	137,399	9,048		6.6	502	471		31	6.6
Mil., L. S. & West.	305	273	30		10.9	70,585	61,845	8,740		14.1	232	225		7	12.0
Min. & St. L.	455	390	65		26.4	147,761	126,594	21,167		16.6	325	352		27	7.7
Mo. Pacific lines:															
Central Branch	387	360	27		7.5	120,576	86,096	34,480		40.0	312	239		73	30.4
Int. & Gt. Northern	775	775				377,821	306,100	71,661		23.4	494	395		99	23.4
Mo. Kan. & Tex.	1,300	1,120	180		16.1	665,866	487,819	178,041		36.5	512	436		76	17.3
Mo. Pacific	980	800	180		22.5	736,676	602,447	134,229		22.3	752	753		1	0.1
St. L., I. M. & So.	810	720	90		13.3	781,305	709,498	71,807		10.1	958	985		27	2.7
Texas & Pacific	1,400	1,090	310		28.4	641,042	401,058	239,984		59.8	458	368		90	24.3
Motlie & Ohio	528	506	22		4.3	307,045	258,811	48,234		18.9	583	511		72	14.0
Nash., Chat. & St. L.	348	348				186,352	173,127	13,225		7.6	535	497		38	7.6
N. Y. & N. England	399	399				261,082	240,063	21,019		8.3	654	606		48	7.9
Norfolk & Western	428	428				224,758	205,690	19,068		9.1	525	481		44	9.1
Northern Central	326	326				490,003	476,623	13,380		2.8	1,503	1,402		41	2.8
Northern Pacific	1,420	972	448		46.1	504,749	349,724	155,025		61.4	398	359		39	10.8
Ohio Central	223	223				76,589	90,020			14.9	330	388		58	14.9
Ohio Southern	138	128	10		7.8	39,156	34,167	4,989		14.7	284	267		17	6.3
Pennsylvania	1,980	1,925	55		2.8	4,157,229	3,721,811	435,418		11.4	2,066	1,939		127	6.5
Peo., Dec. & Evansv.	254	248	6		2.4	49,102	58,704			0.602	184	193		9	5.2
Phila. & Reading	999	991	8		0.5	1,795,371	1,850,889			3.0	1,797	1,882		85	3.5
Rich. & Danville	773	766	7		0.9	322,448	360,938			10.7	417	471		54	11.5
St. L., A. & T. H.	195	195				110,436	96,935	13,501		14.0	568	495		71	19.0
Main Line	121	121				74,090	74,192			0.02	612	613		1	0.1
Belleville Line	146	146				34,953	41,396			15.6	239	294		55	15.6
St. Louis & Cairo	630	645	15		2.4	339,424	287,614	51,810		17.9	514	439		75	14.7
St. Paul & Duluth	173	173				90,318	79,779	10,539		13.2	516	479		37	7.6
St. P., Minn. & Man.	1,060	868	194		22.4	753,516	528,263	225,253		42.6	711	610		101	16.7
Scioto Valley	128	128				46,938	43,762	3,176		7.2	367	342		25	7.2
South Carolina	243	243				149,010	126,061	22,949		18.2	613	519		94	18.2
Tol., Cin. & St. L.	550	435	115		26.4	79,634	74,044	5,590		7.5	145	170		25	14.7
Union Pacific	3,750	3,650	100		2.7	2,294,000	2,267,000	27,000		1.2	612	621		9	1.4
Vicks. & Meridian	142	142				67,828	67,897			60	478	478			
Va. Midland	352	352				139,386	119,384	20,002		16.8	398	336		62	18.6
Wab. St. L. & Pacific	3,320	3,350	170		5.1	1,333,932	1,294,657	39,275		2.9	308	308			
West Jersey	163	163				72,931	63,227	9,704		15.4	447	388		59	15.4
Wisconsin Central	390	390				105,163	94,697	10,466		11.0	270	243		27	11.0
Total, 73 roads	52,844	48,701	4,143		8.5	31,129,153	29,461,768	2,667,385		9.1	589	605		16	2.6
Total inc. or dec.															

SUPPLEMENTARY TABLE.

	1880.	1881.	1882.	1883.
Met. Elevated	18	18		
N. Y. Elevated	14	14		
Oregon Ry. & Nav. Co.	2,150	1,960	100	9.7
Phila. & Read. Coal & Iron Co.				
	1,069,820	1,380,788		

* Not in the table of earnings for the year.
† Does not include branch or leased lines.

‡ Includes all lines east of Pittsburgh and Erie.
§ Railroad, 575 miles; river and ocean lines, 1,575 miles.

Wisconsin, Iowa & Nebraska.—Track laid from Marshalltown, Ia., northeast 5 miles.

This is a total of 24½ miles, making 61 miles thus far reported for 1883, against 138 miles reported at the corresponding time in 1882, and 71 miles in 1881.

THE DENVER & RIO GRANDE COMPANY changed its board of directors this week by choosing four well-known capitalists in place of as many directors who resigned to make room for them. Three of the new directors are directors of other railroads, and speculators pretend to see in this the probability of the union of the Denver & Rio Grande with some other road. But the new directors have no common interest in any other road, so far as is known, none at least in any company which could be worked in connection with the Denver & Rio Grande. Mr. Peter Geddes, one of the new directors, is a director of the Chicago, Burlington & Quincy, which connects directly with the Denver road and interchanges much traffic with it; but he is also a director of the Chicago, Milwaukee & St. Paul, whose interest it is that the Colorado traffic should come by the Union Pacific to Council Bluffs, where it will get a share of it. Mr. Wm. L. Scott is a director of the Union Pacific and the Northwestern (and also of the Lake Shore), and his roads are interested in having as little as possible of the Colorado traffic go by the Burlington road. Mr. L. H. Meyer (who is a trustee of one of the Denver & Rio Grande mortgages) is a director of the Pittsburgh, Fort Wayne & Chicago, to which company it is a matter of indifference where the Colorado traffic goes. Mr. A. J. Cassatt, late First Vice-President and previously General Manager of the Pennsylvania Railroad, is, we believe, not now connected with any railroad except the Denver, but carries great weight as a very skillful railroad manager. If anything concerning the future relations of the road with other companies may be inferred from the accession of the new directors, it is that they will remain as they are; but probably nothing can be inferred

from it, except that some men with large capital and generally successful in their operations have taken an interest in the road, and will do what they can to make it profitable. There are only three companies which could gain any considerable advantage from a union with the Denver & Rio Grande—the Union Pacific, the Chicago, Burlington & Quincy and the Atchison, Topeka & Santa Fe. And the amount of traffic which it interchanges with these roads is not so great as to make the control of it a matter of great importance to any of them. The Denver & Rio Grande is a system by itself, with a nucleus rather than a terminus at Denver, and its profitability, when it is profitable, comes not from the carriage of a large amount of through traffic, but from a light traffic, mostly local, at high rates—inevitable in the very thinly settled mountain country which it serves. Doubtless the traffic which it interchanges with other roads at Denver is well worth having and working for, but it is not enough by itself to justify one of these connecting companies buying or leasing 1,200 miles of road in order to secure it.

The completion of the Denver's line to Ogden and a connection with the Central Pacific will, it is true, enable it to compete for the through traffic of Utah and the Central Pacific. But it will do this at a disadvantage, as there will have to be a transfer both at Ogden and Denver on account of the break of gauge. On this account, and also because of the Leadville business, the Union Pacific could probably gain more than any other company by the control of the Denver & Rio Grande. The road, however, is very well suited to remain independent, and with a division of the Denver traffic among the lines between Denver and the East none of the other companies need feel any anxiety to control it.

THE RAILROAD COMPANIES AND THE CHICAGO BOARD OF TRADE have had a difficulty of a kind that never before occurred, we believe. Some of the railroads have agents on the Board of Trade who make contracts there for shipments

of freight, and some of these agents are members of the Board. On some contract made with the Pennsylvania Railroad Company a member of the Board has preferred a claim for \$7,000. The company contests the claim in the courts; the member demands that it must submit it to the decision of the Arbitration Committee of the Board, and this committee sustains his position and on the refusal of the railroad company to submit to its decision it suspended its representatives from the privileges of the Board. The other railroad companies made common cause with the Pennsylvania and withdrew their agents from the Board.

At the end of 1881 the Chicago Board of Trade had 1,936 members, nearly all grain and provision brokers, etc., for whose use and convenience the board exists. For the mutual convenience of these people as customers and the transportation and insurance companies, there are admitted agents of carriers and of insurance companies, of which the members of the Board of Trade are the largest patrons. This, however, is not the business of the Board. Transportation is not bought and sold there like wheat and pork—it is not traded in, but is bought only for consumption. Now of the 1,936 members at the end of 1881, 56 represented carriers; namely, 20 were vessel agents, who charter vessels for their masters or owners for a commission; 15 were representatives of lake steamer lines—salaried agents; 14 were agents of firms engaged in carting freight in the city; and seven were agents of railroad lines. Other railroads are represented on the Board, but their agents are not members.

that the works probably could have turned out even more steel than they did.

The production of Bessemer steel (ingots) in this country for six successive years, in tons of 2,240 lbs., has been:

1877	1878	1879	1880	1881	1882
500,524	653,773	829,439	1,074,261	1,374,248	1,514,685

The gain last year is smaller in amount than in any other of the four, the amount of gain having been:

1877 to '78	1878 to '79	1879 to '80	1880 to '81	1881 to '82
Tons.... 153,249	175,666	244,822	299,789	140,440
P.c.... 30.6	27.0	37.5	28.0	10.2

The production of steel rails by the Bessemer works is reported by Mr. Swank as only 6 per cent. greater in 1882 than in 1881. There was, however, a large production of rails from imported steel blooms by rolling mills built for rolling iron rails. The production by the Bessemer works from their own steel for six years has been, in tons of 2,240 lbs.

1877	1878	1879	1880	1881	1882
Tons.. 385,865	473,570	610,682	852,196	1,118,865	1,191,383

The amount of increase (72,518 tons) last year was much smaller than heretofore, though the consumption of rails in the country for new road was probably fully 300,000 tons larger in 1882 than in 1881, and the amount of iron rails produced and imported was about 260,000 tons less, and the importation of steel rails 20,000 tons less. The total exports of "unwrought steel" from Great Britain to the United States in 1882 were 131,177 tons—a little less than the year before; but some steel blooms may have come from other countries.

It would appear from these statistics that the consumption of Bessemer steel for other purposes than rails in 1882 was 21½ per cent. of the total production of the home works, and that there has been an increase since 1880 of 45½ per cent. in this consumption for other purposes.

THE SUGGESTIONS CONCERNING CAR SERVICE of the letters lately published have to some extent been anticipated by the action of at least two of the largest roads of Chicago in placing time and other competitive freight under the care of the car record office. These roads also use this office as a means for tracing the responsibility in cases of claim for loss or damage of freight en route, and it seems especially fitted for the purpose. On one of the roads, the distribution of cars is under the charge of the car record office in almost the exact manner suggested in the article. One of the difficulties of the use of cars is the inveterate tendency of the local agent not to respect classes set apart for special service. He finds it easier to load the most convenient car, and will soon have all the special cars in regular service unless there is some one to watch him constantly and keep him to strict account.

THE RAILROAD CAPITAL raised in Europe in 1882, according to the Belgian *Moniteur des Interêts Matériels*, was \$564,084,000, \$164,000,000 of which was for America, while \$225,000,000 was for Great Britain and its colonies. The Russian roads raised \$25,000,000; Holland and Austria-Hungary each about \$16,000,000. The total issues of new capital in Europe for new railroads, government and municipal loans and banking establishments for five successive years are reported as follows, in millions of dollars:

1878	1879	1880	1881	1882
\$86,800,000	\$86,900,000	\$106,040,000	\$140,200,000	\$93,506,000

The amount is thus smaller last year than in any of the others.

THE SCRAP HEAP.

Locomotive Building.

The Schenectady Locomotive Works in Schenectady, N. Y., are to build four passenger engines for the Cincinnati, Indianapolis, St. Louis & Chicago road. They will have 18 by 24 in. cylinders and 5 ft. 9 in. drivers, and will be used on the fast through trains.

The Rogers Locomotive Works in Paterson, N. J., are building five light double-enders locomotives for the Illinois Central road. They are to be used on the suburban passenger trains.

The news reports in our column of old and new roads indicate that the demand for locomotives is not falling off. The New York & New England Co. is about to let contracts for 15 locomotives, the Toledo, Cincinnati & St. Louis wants 25, the St. Paul, Minneapolis & Manitoba needs 15, and similar reports are constantly received. It is noticeable that the demand at present is largely for older roads, new roads not making much figure in the market just now.

Car Notes.

The car-wheel works of Bowler & Co. in Cleveland, O., are making 120 wheels a day, besides other castings.

The Toledo Car Heater Co. in Toledo, O., have a number of orders for the Root patent car heater.

The Lima Car Works in Lima, O., are fully employed on orders for freight cars.

The Erie Car Works in Erie, Pa., are building a number of cars. These works claim that they have the largest stock of seasoned lumber on hand ever collected in this country.

The Peninsular Car Works at Adrian, Mich., are building 200 coal cars, to carry 20 tons each, for the Rochester & Pittsburgh road.

Bridge Notes.

The Morse Bridge Co. in Youngstown, O., has secured the contract for an iron bridge over the Scioto River on State street in Columbus, O. The contract price is \$16,400.

Kellogg & Maurice in Athens, Pa., have a number of contracts for railroad and highway bridges on hand.

R. F. Hawkins & Co., of Springfield, Mass., have taken the contract to build the new bridge across Lake Champlain at Rouses Point, for the St. Johnsbury & Lake Champlain road. The bridge will be a pile bridge about 2 miles long, with two draw-spans, and will cost about \$150,000. Work is to be begun very soon.

Iron Notes.

The Lowmoor Furnace in Alleghany County, Va., is in full blast and making 125 tons of pig iron a day.

All the rolling mills in Youngstown, O., are working full double turn.

Mr. Samuel Coit purposes building a new blast furnace in

RAILROAD EARNINGS, YEAR ENDING DECEMBER 31.

NAME OF ROAD.	MILEAGE.					EARNINGS.					EARNINGS PER MILE.				
	1882.	1881.	Inc.	Dec.	P. c.	1882.	1881.	Increase.	Dec.	P. c.	1882.	1881.	Inc.	Dec.	P. c.
Ala. Gt. Southern.....	290	290				\$ 856,724	\$ 789,372	\$ 67,352		8.5	\$ 2,954	\$ 2,722	\$ 232		8.5
Atchison, Top. & S. F.*	1,816	1,690	156		9.4	14,865,354	12,584,509	2,280,845		18.1	8,186	7,581	605		8.0
Buff., Pitts. & West*.....	216	505	11		5.4	885,475	685,079	209,796		30.4	4,146	3,345	801		23.9
Bur., Cedar Rap. & No.	639	566	73		12.9	2,800,679	2,259,036	541,643		24.0	4,393	3,991	402		10.1
Canada Southern*.....	404	404				3,452,795	3,369,259	83,536		2.5	8,546	8,340	206		2.5
Central Iowa.....	244	199	45		22.6	1,165,178	1,001,906	163,812		16.4	4,775	5,032		257	5.5
Central Pacific.....	3,010	2,680	330		12.3	25,713,150	24,094,099	1,619,051		6.7	8,543	8,906		447	5.0
Chi. & Alton.....	847	843	4		0.5	8,211,989	7,537,740	654,249		8.6	9,605	8,138	730		8.1
Chi., Bur. & Quincy*.....	3,009	2,850	159		5.6	21,200,000	21,324,150		124,150	0.7	7,045	7,446		441	5.8
Chi. & Eastern Ill.....	235	223	12		5.4	1,773,022	1,640,451	132,572		8.1	7,545	7,356	189		2.6
Chi. & Gr. Trunk*.....	335	335				2,274,263	1,563,025	711,238		45.5	6,789	4,608	2,183		45.5
Chi., Mil. & St. Paul.....	4,294	3,848	446		11.6	20,387,000	17,025,456	3,361,544		19.7	4,748	4,424	324		7.3
Chi. & Northwestern.....	3,334	2,850	484		17.0	23,828,978	21,849,209	1,979,769		9.1	7,147	7,066		519	6.8
Chi., St. P., Minn. & O.	1,055	955	100		10.5	4,973,032	4,021,961	951,091		23.5	4,714	4,211	503		13.4
Cin., Ind., St. L. & Chi.	373	332	41		12.3	2,645,529	2,415,372	230,157		9.6	7,093	7,275		182	2.5
Cin., N. O. & Tex. Pac.	336	336				2,570,957	2,358,049	212,908		9.0	7,649	7,018	631		9.0
Clev., Akron & Col.	144	144				505,967	423,098	82,869		16.7	3,514	2,942	572		18.4
Col., Hock. V. & Tol.	320	320				2,867,288	2,456,810	410,478		16.7	8,960	7,676	1,284		16.7
Denver & Rio Grande.....	1,100	799	301		37.5	6,349,858	5,980,488	369,370		6.2	5,773	7,485		1,712	22.9
Des. M. & Ft. Dodge.....	94	88	6		6.8	347,168	401,925		54,757	13.6	3,681	4,567		886	19.4
Det. Lan. & No.....	226	226				1,594,961	1,377,698	217,263		15.8	7,057	6,096	961		15.8
Eastern.....	284	283	1		0.3	3,413,840	3,187,416	226,425		7.1	12,021	11,263	758		6.7
Flint & Pere Marq.....	345	318	27		8.5	2,156,927	1,875,146	281,781		15.0	6,252	5,893	359		6.0
Guil. Col. & S. F.*.....	382	294	118		44.7	1,628,914	1,060,187	568,727		53.6	4,264	4,016	248		6.1
Hannibal & St. Jo.....	292	292				2,303,388	2,257,731	46,157		2.1	7,888	7,720	168		2.1
Houston, E. & W. Tex.	104	86	18		26.9	268,860	165,728	101,132		60.9	2,566	1,927	639		33.5
Houston & Tex. Cen.....	522	522				3,175,389	3,748,655		573,266	15.3	6,087	7,181		1,094	15.3
Ill. Cent., Ill. lines.....	920	918	2		0.2	6,914,867	6,733,955	180,912		2.7	7,516	7,335	181		2.5
Iowa lines.....	402	402				1,916,414	1,582,442	333,972		3.5	4,767	4,608	159		3.5
Ind., Bloom. & West.....	625	555	70		12.6	2,641,675	2,487,569	154,106		6.2	4,227	4,482		255	5.7
Kan. City, Ft. St. & G.	445	310	35		11.3	1,750,382	1,554,556	195,826		12.6	5,074	5,015	59		1.2
Lake Erie & Western.....	386	386				1,477,027	1,376,572	100,455		7.4	3,826	3,566	260		7.4
Lake Shore & Mich. S.*	1,202	1,177	25		2.1	18,275,009	17,971,391	303,609		1.7	15,204	15,366		65	0.4
Long Island.....	345	325	20		6.2	2,300,018	1,974,861	325,157		16.5	6,667	6,076	591		9.7
Louisville & Nashv.....	2,025	1,870	155		8.3	12,981,138	11,344,362	1,636,776		14.4	6,410	6,007	403		6.6
Mar., Hought. & Ont.....	91	88	3		3.4	1,197,426	903,519	293,907		32.5	13,159	10,287	2,872		28.4
Michigan Central*.....	950	950				8,950,000	8,934,332	15,668		0.2	9,421	9,404	17		0.2
Mil., Lake Sh. & West.	289	254	35		13.9	886,152	635,659	250,493		39.4	3,066	2,503	563		22.5
Mo. Pacific lines.....	387	305	82		27.0	990,493	967,778	28,715		3.0	2,575	3,173		498	18.7
Central Branch.....	775	636	139		21.8	3,919,540	2,788,106	531,434		19.1	4,283	4,384		101	2.3
Int. & Gt. No.....	1,238	947	291		30.7	6,421,517	5,427,256	994,261		18.3	5,187	5,306		122	2.3
Mo., Kan. & Tex.....	909	769	140		18.5	8,038,194	6,673,294	1,364,900		20.4	8,844	8,701	143		1.6
St. L., Iron Mt. & So.	756	600	156		26.0	7,581,635	7,337,662	243,973		3.3	10,029	10,634		605	5.7
Texas & Pacific.....	1,097	844	253		30.0	5,143,109	3,977,412	1,165,757		29.1	4,688	4,713		25	0.5
Mobile & Ohio.....	528	506	22		4.3	2,179,692	2,403,220		223,528	0.3	4,128	4,749		621	13.1
Nash., Chattanooga & St. L.	348	348				1,933,047	1,975,258		42,211	6.4	5,555	5,992		408	6.4
N. Y. & New England.....	399	336	63		18.8	3,288,185	2,809,943	478,252		20.6	8,492	8,363	129		1.5
Norfolk & Western.....	428	428				2,429,740	2,267,288	162,452		7.2	5,677	5,297	380		7.2
Northern Central.....	326	326				5,800,176	5,443,700	356,476		6.5	17,792	16,698	1,094		6.5
Northern Pacific.....	1,269	816	393		48.2	7,009,340	4,070,223	2,939,117		72.2	5,798	4,988	810		16.2
Ohio Central.....	232	232				1,039,463	712,000	327,463		46.0	4,480	3,069	1,411		46.0
Pennsylvania.....	1,950	1,914	36		1.8	49,079,694	44,124,183	4,955,511		11.2	25,169	23,093	2,076		9.0
Peoria, Dec. & Evans.....	254	234	20		8.5	709,529	688,072	21,456		10.5	2,994	2,940	54		1.8
Phila. & Reading.....	995	994	1		0.1	21,834,508	20,776,101	1,058,407		5.1	21,944	20,902	1,042		5.0
Pitts. & Lake Erie*.....	70	70				1,265,748	1,041,063	224,685		21.6	17,962	14,738	3,224		21.6
Rich. & Danville.....	770	760	10		1.3	3,657,920	3,566,862	91,058		2.6	4,751	4,604	57		3.2
St. L., Alt. & T. H.,	195	195				1,371,532	1,424,803		53,271	3.6	7,033	7,307		274	3.6
Main Line.....	121	121				756,024	756,024			15.6	7,221	6,248	973		15.6
St. L. & Cairo.....	146	146				380,410	427,663		47,247	11.0	2,605	2,929		324	11.0
St. L. & San Francisco.	660	622	38		6.1	3,582,811	3,100,522	482,288		13.4	5,429	5,081	348		6.8
St. P. & Duluth.....	175	175				1,105,410	733,862	371,548		50.6	6,317	4,193	2,124		50.6
St. P., Minn. & Manitoba	985	797	188		23.5	8,704,771	4,878,990	3,885,811		79.6	8,898	6,122	2,776		45.5
Scioto Valley.....	128	117	11		9.4	540,192	446,916	93,276		20.8	4,220	3,820	400		10.4
South Carolina.....	243	243				1,313,746	1,245,287	68,459		5.5	5,408	5,125	281		5.5
Tol., Cin. & St. L.....	498	381	87		22.9	942,436	700,940	241,496		34.5	2,014	1,840	174		9.5
Union Pacific.....	3,732	3,400	272		7.8	30,068,198	29,766,595	311,293		1.0	8,062	8,062		544	0.3
Va. Midland.....	3,383	3,189	233		7.3	15,315,363	14,831,819	483,544		3.3	6,789	6,789		611	0.1
Wab., St. L. & Pac.....	3,383	2,750	633		23.0	16,738,358	1,466,778	2,270,509		15.4	4,948	5,261		313	8.9
West Jersey.....	163	163				1,109,879	988,626	121,253		12.3	6,809	6,065	744		12.3
Total, 69 roads.....	55,252	49,828	5,424		10.9	421,619,395	380,734,085	42,103,770	1,218,460	10.7	7,631	7,641		10	0.0
Total inc. or dec.....			5,424		10.9			40,885,310						10	0.0

was the cause of a popular conductor being suspended for 80 days.—*Atlanta Constitution*.

The First Locomotive in Iowa.

Every little while one sees in the papers a wrong statement concerning the arrival of the first locomotive ever brought to Iowa. The *St. Paul Pioneer-Press* the other day said it was the "John A. Dix," and the time was in the winter of 1854, the place Davenport. The "History of Scott County," recently published, says that "July 30, 1855, the first locomotive ever seen in Iowa arrived in Davenport, called the 'Antoine LeClaire,' and the *Des Moines Register* of the 24th inst. has this paragraph:

"The weather clerk appears to be determined to beat all previous cold weather records, and there seems to be no prospect of a let-up in the coldness until all the old settlers give up beaten. Uncle Thomas French is about the only old settler that we know of that still insists that this is a mild winter as compared with the winter of 1854, during which winter the first locomotive in Iowa, the 'John A. Dix,' crossed the Mississippi on the ice at Davenport."

This statement is also wrong. Uncle Thomas French doesn't remember the important circumstances correctly; but it is not surprising. Talk with the old settlers who lived in Davenport at the time the first locomotive was brought here, saw it as it was moved up the streets to Fifth street and placed on the first railroad laid in Iowa, and they disagree as to the time of the occurrence and name of the locomotive.

There is one resident in Davenport who does know all about it, however—the Hon. John E. Henry, who was a prominent railroad official at the time, and superintended the bringing of the locomotive across the river from Rock Island to Davenport, and to him a *Democrat* reporter went this forenoon for information.

Mr. Henry said that the first locomotive brought into Iowa by the Mississippi & Missouri (Davenport and Council Bluffs) Railroad Co., was the "Antoine LeClaire," which was transported from Rock Island on a flatboat in the fall of 1854.

The second locomotive was the "Iowa," brought over in the same way the same season.

The third was the "John A. Dix," brought over on the ice in the winter of 1854-55. That was a cold winter. Mr. Henry says that when an examination of the ice was made to see if it would bear up a ponderous locomotive (for those days) they found it so thick that they could not find water—the water was frozen to the bottom of the river along the route taken for the locomotive track across the ice bridge.

So, now, all ye journalists take notice—the question as to precedence of locomotives in Iowa is settled.—*Davenport (Ia.) Democrat*.

A Lonely Little Traveler.

On train No. 3 from New York on the Erie Railway yesterday, there was a little nine-year-old girl named Mary Ann Donahue, entirely unattended, on her way to join relatives at Pontiac, Ill. The little girl informed an *Advertiser* reporter that she had come all alone, via Anchor Line steamer from Lexton, England; that her father and mother were both dead; that she had expected her uncle, Theodore O'Hare, of Pontiac, to meet her in New York, but for some reason he had been unable to do so, and she was going on across the continent alone. She said her father used to be an officer in the British army, and she had twice been in India with him before he died. She is certainly a very bright and precocious child, and won the friendship of Conductor Herby and all the passengers who heard her story.—*Elmira (N. Y.) Advertiser*.

New Sleeping Cars.

Two Pullman sleeping cars just completed for the Central Vermont line between Boston and Montreal are described by the *Boston Herald* as follows: "These cars are named 'Pilgrim' and 'Puritan'. They arrived in Boston last week and began running the week of the Montreal carnival—Jan. 22-28. As the cars have several novel features a description will be of interest in this connection. The general appearance of the interior of the 'Puritan' is palatial. The woodwork is mainly dark mahogany, finely carved and highly polished. The upper berth panels and partitions are inlaid with satin, ebony and other fancy woods elaborately carved. The upper deck and roof are lined with whitewood veneering, which is artistically hand-painted. The upholstery is in crimson plush, and the window and berth curtains are of raw silk. There are ten large centre lamps of beautiful design. These and the other trimmings in the car are of burnished brass or silver. The carpet is of a rich pattern, and the glass in the doors and partitions is of French plate, neatly embossed. The car is luxuriously finished and furnished. A spacious wash-room is located at one end of the car, fitted with bowls, mirrors and toilet utensils of the best make. Adjoining this is a cosy compartment luxuriously furnished for a smoking room. A passageway around this smokers' salon leads to a handsome buffet which faces the main compartment of the car. This little room is attractively fitted up with a side-board of fanciful design, which contains a set of handsome breakfast table-ware for serving out tea or coffee, oyster stews and other light refreshments at a nominal price to the passengers. A small safety stove and other utensils are arranged in a separate compartment, the whole being in charge of a competent steward. At the other end of the car is a handsome parlor or drawing room for ladies, with a commodious lavatory adjoining. The car is warmed by hot-air pipes under each seat. The exterior of the car is painted a dark olive green, and is richly ornamented in gold and colors. The 'Pilgrim' is similar in all respects to the 'Puritan,' and cost some \$22,000."

The Brotherhood of Locomotive Engineers.

Mr. T. S. Ingraham, the second officer of this organization, in answer to a statement by some Pittsburgh railroad man that the Brotherhood was losing ground, said to a *Cleveland Herald* reporter recently that it has now 205 divisions and 12,000 members, against 150 divisions and 7,000 members in 1877, that 32 new divisions were organized in 1882, and 10, thus early, this year. He said: "The organization now extends from Sprague, W. T., down to the coast through the entire region of California and Arizona. There are two lodges in Arizona and one in New Mexico. Last season we extended through New Brunswick and Nova Scotia to Halifax, and we are about instituting a lodge in Old Mexico. When we organized last season in Nova Scotia the railway officials endeavored to crush us by discharging all engineers who joined. When this fact was brought to the attention of the Prime Minister and Minister of Railroads the company was immediately ordered to reinstate the discharged men and pay them for the time they had lost by reason of their removal."

Railroad Young Men's Christian Association.

The following items of interest are obtained from the annual report of Mr. S. C. King, Secretary in charge of the railroad work of the Young Men's Christian Association in St. Louis.

There were 19,500 visitors at the Union Depot reading room and 35,929 at the Association reading-room, East St. Louis; 3,319 letters were written by railroad men at the

East St. Louis room, and over 1,000 at the Union Depot; 5,278 papers were filed at both rooms. Ten entertainments were given at East St. Louis with a total attendance of 2,755. Six lectures were attended by many persons; 178 religious meetings were held, having an attendance of 8,293; 180 railroad men joined the Association at East St. Louis during 1882, embracing employes from every company and from each department of service.

A library of 350 volumes was secured, and bath-rooms (the only ones in East St. Louis) were put in their building in June last. A temporary hospital room for injured men was furnished by the Railroad Ladies' Auxiliary, and has been used by almost every line centering there. The committee encouraged an enlargement of the work.

Buried by a Snow-Slide.

On the afternoon of Jan. 30 a passenger train on the Denver & Rio Grande road was delayed by snow near Crested Butte, Col. Leaving the train behind the engine went ahead to clear the track. It had gone near four miles when a heavy snow-slide came down the mountain, carrying the engine bodily with it for some distance from the track, and leaving it buried under 30 ft. of snow.

Train Robbers Captured.

The men who recently attempted to rob a Central Pacific train not far from Ogden were captured Jan. 29, after a ten days' chase, by a sheriff and 18 men, at their headquarters, in a lonely spot near the boundary line between Utah and Nevada. There were five of them, and they had been in the neighborhood for some months, stealing stock and making themselves a nuisance generally to the surrounding country.

A New St. Louis Bridge.

A bill has been introduced in Congress to authorize the building of a new bridge over the Mississippi at Chain of Rocks in the northern part of St. Louis. The incorporators named are John L. Ferguson, James Gibson, Joseph P. Card, Amos Hoffer, W. L. Hickman, Joseph Bittner, Joseph S. Case and Holland B. Evans. The incorporators claim that this is a solid enterprise and that the bridge will be built, if the bill pass. It will be both a railroad and highway bridge.

Continuous Brakes for Freight Trains.

A contract has recently been made with the Westinghouse Brake Co. for the equipment of all the freight cars on the Central Pacific, the Southern Pacific and the other Huntington roads, including the Chesapeake & Ohio, with the Westinghouse continuous freight train brake. The Westinghouse Co. is to supply a stipulated number per month until all the cars are equipped.

An Accident that Tested the Strength of Cars.

Mr. Alfred Pell, an English gentleman, who was a member of the Royal Commission which reported, in 1879, on the shipment of American cattle to England, and who has recently visited the ranch country of Colorado, etc., gave a reporter of the *New York Tribune*, recently, the following account of a railroad accident in Indiana:

"Now let me tell you of the most remarkable railway accident man ever looked at. I haven't seen anything about it in the papers. We left St. Louis at 7 o'clock last Saturday evening (Jan. 20) by the Vandavia line. At 4 o'clock the next morning, when we were twenty miles west of Indianapolis, I was awakened in my Pullman car by a great knocking and bumping, and in a few moments the car came to a standstill. When I got out I beheld this: The engine was 200 yards ahead by itself, the tender being off the rails. At the place the track is on an embankment eight or ten feet high, and there is a vacant space of land between the bottom of the line and the fence. The ground was covered with long grass, snow and ice. The whole train was spread out back of the engine, the cars retaining their relative positions, but the line extending down the bank and along the bottom in a curved line, like a snake. The two mail cars were on their sides and without wheels; the express cars and two freights (baggage) had no wheels, but stood on their bottoms. A passenger car came next; some of its wheels were gone, one end was on the line and the other at the bottom of the bank. The Pullman I was in had just left the rails, as had another, and two that followed it were on the track. The mail bags had caught fire and were burning, but were afterward saved. Now for the strangest feature—not a single person was hurt. The ground was so hard that the wheels ran on it until they were torn off, and then the cars began to slide and went down like boys a-coasting. The cause of the accident was a sharp frost which had broken the steel rail as sharply as a piece of glass. A train came for us at 8 o'clock, and we made such good time after that that we were only four hours late in New York. The American gentlemen didn't seem to make much of it. The conductor stayed abed."

A Caution.

Mr. F. C. Nims, General Passenger and Ticket Agent of the Denver & Rio Grande Railway, requests the publication of the following word of caution:

"Some months ago a person calling himself W. L. Frost obtained by misrepresentations, from our Chicago office, electrotypes of a map and several scenic cuts, ostensibly for the purpose of issuing a handsome 'Shipper's Guide' for general distribution. After ordering a few worthless sheets, which were never claimed from the printer or paid for, he collected various amounts from Chicago business houses and disappeared, taking with him the electrotypes referred to."

"Recently a party under the name of C. H. Robinson and claiming to act with the sanction of this company, has worked the same scheme in Philadelphia. There is little doubt that the two names are used by the same individual, and that under other aliases and with the plausibility the possession of the stolen electrotypes may give him he will attempt the same fraud in other localities. The public is cautioned against this swindler, and any assistance which will lead to his apprehension and punishment will be gratefully appreciated."

"We do not endorse outside advertising schemes nor employ solicitors, and any persons claiming to act in such manner by our authority may be safely treated as frauds. The press is respectfully requested to assist in the dissemination of the above facts."

A Perilous Situation.

When the regular train which left Rat Portage yesterday morning was nearing the bridge over the Winnipeg River, the driver noticed a man walking on the structure. The train approached the bridge by a curve, so that the man could not see his danger. The bridge is too narrow to permit a person to stand on one side till a train should pass, and it was impossible for him to reach the other side before the train would overtake him. To jump from the bridge was certain death. The only course open was to clutch the outer board, and suspended between life and death, await the result. This the man did, and the train, which could not be stopped, came thundering on. The conductor, recollecting that the steps of the Pullman car were very low, and would probably strike the man's head, rushed to the rear of the train and uncoupled the car, which, by the prompt

application of the brakes, was stopped in time. The man pulled himself up and reached the other end of the bridge.

At this instant a freight train was observed backing around the curve, and there stood the Pullman car in the middle of the bridge, filled with the terrified passengers, for the front part of the train had gone off. The engine of the freight train was attached to the rear end, so that it was impossible for the engineer to see the Pullman car. To leave the Pullman car was certain death, as the passengers had no means of escape, and notwithstanding the shouts of the train officials, the freight train came thundering on. It was a forlorn hope, but it was the only one, and quick as a flash Conductor Trodden of the passenger train signalled the engineer, who had gone off with the front part of the train, to back up. He saw the danger, but, true to his calling, reversed his engine and sped back over the bridge on his mission of mercy. He reached the car, the coupling was made, the lever thrown backward, and not an instant too soon the Pullman car and its precious load were drawn from the threshold of death. Silently, and with awed faces the passengers rode to the city, each one realizing how close had been their call. The caboose attached to the freight train was also filled with passengers, but when they saw their danger many of them jumped from the car into the snow-drifts.—*Winnipeg Sun*.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings will be held as follows:
Delaware, Lackawanna & Western, annual meeting, at the office, No. 20 Exchange Place, New York, Feb. 20, at 10 a. m. Transfer books closed Jan. 31.
Housatonic, annual meeting, at the office in Bridgeport, Conn., Feb. 23.
Missouri Pacific, annual meeting, at the office in St. Louis, March 13.
New York, Lackawanna & Western, annual meeting at the office in New York, Feb. 20, at noon.

Railroad Conventions.

The *Western Association of General Passenger and Ticket Agents* will hold its next regular meeting at the Southern Hotel, St. Louis, beginning Wednesday, Feb. 14, at 11 a. m. The annual election of officers will take place at this meeting.

Technical Meetings and Conventions.

The *Master Car-Builders' Club* will hold its next meeting at the rooms, No. 113 Liberty street, New York, on Thursday evening, Feb. 15, at 8 o'clock. Subjects for discussion, the Heating and Lighting of Passenger Cars, and the Construction of Car Seats.
The *American Institute of Mining Engineers* will hold its annual meeting in Boston, beginning on Tuesday, Feb. 20.
The *Master Mechanics' Association* will hold its annual convention in Chicago, June 19 next.

Dividends.

Dividends have been declared as follows:
Cedar Rapids & Missouri River (leased to Chicago & Northwestern), 3½ per cent., semi-annual, on preferred, and 1 per cent., quarterly, on common stock, payable Feb. 1.
Connecticut & Passumpsic Rivers, 3 per cent., semi-annual, on preferred stock, payable Feb. 1.
Massachusetts (leased to Connecticut & Passumpsic Rivers), 3 per cent., semi-annual, payable Feb. 1.
New York, Providence & Boston, 2 per cent., quarterly, payable Feb. 10. Transfer books closed Feb. 1.

Foreclosure Sales.

The *Denver, Longmont & Northwestern* road is to be sold in Denver, Col., March 6, under foreclosure of mortgage. The road is completed for a few miles out of Denver, Col., but it has been always very difficult to get any information concerning it.

ELECTIONS AND APPOINTMENTS.

Atchison, Topeka & Santa Fe.—The following circular has been issued: "Mr. A. A. Robinson, as Chief Engineer of this road and its leased lines (Leavenworth, Topeka & Southwestern; Manhattan, Alma & Burlingame; New Mexico & Arizona and the Sonora Railway), will have charge of the track, bridge, building and water service departments and of all matters pertaining to the office of Chief Engineer of these railroads."

Chicago, Burlington & Kansas City.—Mr. W. E. Cunningham has been appointed Chief Train Dispatcher, with office in Keokuk, Ia., in place of H. H. Libbie, resigned.

Chicago & Lake Superior.—At a meeting held in New York recently the following directors were chosen: S. C. Hall, Whitewater, Wis.; James Haskins, Geneva Lake, Wis.; Wm. H. Conger, Elkhorn, Wis.; Wm. H. Barnum, Lime Rock, Conn.; John C. Barnes, Henry H. Boddy, Charles J. Canda, Wm. R. Chadsey, Monroe Chubb, Dexter A. Hawkins, Benjamin Homans, George E. Rawlins, Simon Stevens, New York. The board elected Simon Stevens, President; George E. Rawlins, Secretary; Wm. R. Chadsey, Treasurer; Dexter A. Hawkins, Counsel; W. A. Ogden Hegeman, Attorney; Charles J. Canda, Dexter A. Hawkins, H. H. Boddy, Simon Stevens and John C. Barnes, Executive Committee.

Cincinnati, Van Wert & Michigan.—At the annual meeting, Jan. 16, the following directors were chosen: Henry Van Tilburg, Shane's Crossing, O.; L. L. Bell, Greenville, O.; Isaac P. Glasser, Paulding, O.; A. V. Rice, Ottawa, O.; Henry Burt, J. M. C. Marbles, Van Wert, O.; M. E. Dawes, D. M. Lewis, Cincinnati; James M. Pendleton, Providence, R. I.; Richard Smith, Plainfield, N. J.; H. D. V. Pratt, Elmira, N. Y.; H. G. Coffin, Brooklyn, N. Y.; Grinnell Burt, H. H. Cook, W. C. Sheldon, New York.

Columbus & Xenia.—At the annual meeting in Columbus, O., Jan. 25, the old officers were re-elected, as follows: President, J. R. Swan; Secretary and Treasurer, Robert S. Smith. The road is leased to the Pittsburgh, Cincinnati & St. Louis.

Connecticut River.—The new board has re-elected N. A. Leonard President; Seth Hunt, Clerk and Treasurer.

Denver & Rio Grande.—At a meeting of the board in New York, Jan. 29, Messrs. A. J. Cassatt, Peter Geddes, L. H. Meyer and Wm. L. Scott were chosen directors in place of L. K. Bass, J. W. Gully, J. E. Lundstrom and H. A. Risley, resigned. The new directors are all well known as railroad officers. Mr. Cassatt was recently Vice-President of the Pennsylvania Railroad Co.; Mr. Geddes is a director of the Chicago, Burlington & Quincy and the Chicago, Milwaukee & St. Paul; Mr. Meyer is a director of the Pittsburgh, Fort Wayne & Chicago and Mr. Scott is a director of the Lake Shore & Michigan Southern and several other companies.

The board subsequently elected L. H. Meyer First Vice-President, to fill a vacancy which has existed for several months.

Detroit, Indiana & St. Louis.—The directors of this new company are: A. B. Ball, Owen Black, W. Bybee, A. J. Dunear, Hiram Iddings, Amos Kist, S. W. Oldfather, F. M. Pearson, John Singery, Albert Tucker, Horace Tucker, Wm. Worden.

Eureka & Palisade.—Mr. Byron Gilman has been appointed General Superintendent in place of P. Everts, resigned. Office in Eureka, Nevada.

Fall River.—This company has elected officers as follows: President, Charles F. Choate; Directors, F. L. Ames, J. A. Beauvais, H. A. Blood, J. S. Brayton, George Marston, Morgan Rotch, Wm. Rotch, N. W. Turner; Clerk, Wm. Rotch; Treasurer, J. M. Washburn. The road is leased to the Old Colony Co.

Fitchburg.—At the annual meeting in Boston, Jan. 30, the following directors were chosen: Seth Bemis, Robert Codman, Charles F. Crocker, Franklin N. Poor, Wm. B. Stearns, Rodney Wallace, Charles A. Welch. The board re-elected Wm. B. Stearns, President; T. Whittemore, Clerk; Mason D. Benson, Treasurer.

Galveston, Harrisburg & San Antonio.—Mr. A. N. Towne has been appointed General Manager of this road, and the position of General Superintendent is abolished. The road will hereafter be worked under the same management as the Central Pacific, and will include the Texas & New Orleans and the Louisiana Western roads, bringing under this management the entire line from El Paso, Tex., to Vermillionville, La. A circular from Mr. Towne says:

"Arrangements having been effected by the various railway companies interested for the unification of their joint administration as a continuous line between the Pacific Ocean and the Gulf of Mexico with a view both to economy and celerity in the dispatch of business, the following announcements are made to take effect Feb. 1, 1883: The Hon. J. F. Crosby, Vice-President, having retired from the position of General Manager of the Texas & New Orleans Railroad and the Louisiana Western Railroad, the undersigned has been appointed to fill the vacancy. The duties pertaining to the office of Vice-President of the Texas & New Orleans Railroad Company will hereafter be defined. Maj. James Converse having resigned the position of General Superintendent of the Galveston, Harrisburg & San Antonio Railway, this office, together with those of assistant superintendent and master of transportation, are abolished.

"The line from El Paso, Tex., to Vermillionville, La., will be known as the Galveston, Harrisburg & San Antonio Railway system, over which the officers of the executive, transportation, and accounting departments of the Southern Pacific Railroad will exercise general supervision, and for which the following changes and appointments are announced:

"E. G. Thompson, Superintendent; Maj. James Converse will retain charge of the construction work, and as Chief Engineer of the El Paso, San Antonio and Houston divisions; C. C. Gibbs, General Freight Agent; T. W. Peirce, Jr., General Passenger Agent; D. A. Sullivan, General Baggage Agent, headquarters at Houston. The line between El Paso and Sanderson will be known as the El Paso Division, of which James Campbell is appointed Superintendent and J. L. Bonner, Master Mechanic, headquarters at El Paso. The line between Sanderson and San Antonio, including branch to Eagle Pass, will be known as the San Antonio Division, of which W. G. Van Vleet is appointed Superintendent, and J. J. Ryan, Master Mechanic, headquarters at San Antonio. The line between San Antonio and Houston, including branches, will be known as the Houston Division, of which H. Flanders is appointed Superintendent, headquarters at Columbus, and D. T. Davis, Master Mechanic, headquarters at Harrisburg. The line between Houston and Vermillionville will be known as the Louisiana Division, of which W. Irvin is appointed Superintendent, and D. C. Smith, Master Mechanic, headquarters at Houston. N. R. Olcott, Chief Engineer, will remain in charge of buildings and bridges on the Louisiana Division, headquarters at Houston. All other officers and agents are continued."

Georgia Pacific.—The following announcements are made under date of Jan. 22:

"1. Capt. I. Y. Sage is, at his own request, relieved from duty as Superintendent of First Division, Georgia Pacific Railway.

"2. Col. G. J. Foreacre is appointed Superintendent of the Georgia Pacific Railway, with headquarters at Atlanta, Ga. He will be respected and obeyed accordingly."

Hartford & Connecticut Valley.—The directors have elected Samuel Babcock President; George H. Watrous, Vice-President.

Mexican Central.—Mr. S. W. Hastings has been appointed Chief Train Dispatcher of the First Division (Mexico City to Silas) in place of C. H. Cornell, transferred.

Mexican National.—The following circular is dated Laredo, Tex., Jan. 23:

"S. T. Fuller having resigned the position of Chief Engineer and General Superintendent of the Northern Division, the duties of Engineer of Construction will devolve upon Assistant Engineer E. A. Handy, who is hereby appointed Engineer in Charge, reporting direct to the General Manager.

"F. A. Lister having been appointed Superintendent of the Northern Division, he will take charge of the Transportation Department, assuming all duties appertaining to the lines from Corpus Christi to Monterey and beyond when constructed and accepted by the Mexican Government, this including all lighters and property appertaining thereto as General Manager."

Mr. Lister was recently Superintendent of the Camden & Atlantic road.

Michigan Central.—Mr. Louis D. Heusner has been appointed Chicago City Passenger Agent in place of W. F. White, resigned. Mr. Heusner was recently with the New York Central.

Missouri Pacific.—Mr. C. G. Eddy has been appointed General Eastern Agent, with office in New York. He was formerly with the Chicago & Northwestern.

Mobile & Girard.—Mr. W. G. Raoul has been chosen President of this company.

Montreal, Portland & Boston.—This company has elected S. T. Willets, President; A. B. Chaffee, Vice-President; M. S. Loneragan, Secretary and Treasurer. The road is leased to the Southeastern, of Canada.

Newburg, Dutchess & Connecticut.—At the annual meeting at Moore's Mills, N. Y., Jan. 26th, the old board was re-elected, with the addition of Richard C. Van Wyck and S. J. Wright to fill vacancies. The board re-elected John S. Schultz, President; W. A. Wells, Secretary.

New York Central & Hudson River.—Mr. W. B. Jerome has been appointed Western Passenger Agent in place of Louis D. Heusner, resigned, to take effect Feb. 1, 1883. His office is at No. 68 Clark street, Chicago, Ill.

New York, Chicago & St. Louis.—At the annual meeting in Cleveland, Jan. 30, the following directors were chosen: Anson Stager, Chicago; Stevenson Burke, D. W. Caldwell, J. H. Devereux, Charles Hickox, J. H. Wade, Cleveland, O. Augustus Schell, James Tillinghast, H. McK. Twombly, W. K. Vanderbilt, Cornelius Vanderbilt, F. W. Vanderbilt, W. C. Whitney, New York. The board elected W. K. Vanderbilt, President; D. W. Caldwell, Vice-President and General Manager; F. W. Vanderbilt, Secretary and Treasurer; H. H. Hammersley, Assistant Treasurer.

New York, New Haven & Hartford.—Mr. Wm. D. Bishop, Jr., has been chosen Secretary in place of Edward I. Sanford, resigned.

Pittsburgh, Bradford & Buffalo.—At the annual meeting in Foxburg, Pa., the following were chosen: President, Charles W. Mackey, Franklin, Pa.; Directors, James W. Rowland, Emlenton, Pa.; P. F. Kribbs, Edensburg, Pa.; George W. Arnold, Clarion, Pa.; James Callery, John W. Chalfant, W. C. Mobley, Pittsburgh.

Pullman Southern Car Co.—Mr. Thomas H. Hart has been chosen Second Vice-President. Mr. George F. Brown is appointed General Superintendent and James Martin, Assistant Superintendent, with headquarters in Louisville.

St. Louis, Keokuk & Northwestern.—Mr. W. E. Cunningham has been appointed Chief Train Dispatcher, with office in Keokuk, Ia., in place of H. H. Libbie, resigned.

Southwestern Pool Arbitrator.—At a joint meeting held in Chicago, Jan. 30, of the Southwestern Railway Association, the Iowa Trunk Lines Association and the Colorado Traffic Association, Mr. George M. Bogue, of Chicago, was chosen Arbitrator. He has been a member of the Illinois Railroad Commission, generally in charge of grain inspection.

Springfield & New London.—At the annual meeting in Springfield, Mass., Jan. 24, the following directors were chosen: H. M. Phillips, E. D. Metcalf, J. M. Stebbins, E. W. Ladd, E. P. Chapin, Henry Fuller, J. H. Appleton, James Kirkham, Wm. Birnie, Horace Smith, Virgil Perkins, M. Pinkney, C. L. Covell. The road is leased to the New York & New England.

Toledo, Ann Arbor & Grand Trunk.—Mr. J. B. Connors is appointed Train-Master in place of J. C. Carland, resigned. Mr. Connors will continue to act also as Chief Train Dispatcher.

Union Pacific.—Mr. J. F. Wiley is appointed City Passenger Agent for this company in New York, with headquarters at No. 287 Broadway, appointment to take effect Feb. 1, 1883.

Mr. E. R. Tuttle is appointed Traveling Passenger Agent for this company for District No. 14, with headquarters in St. Louis. Appointment takes effect Feb. 1, 1883.

Warren & Farnsworth Valley.—At the annual meeting recently, the following were chosen: President, Myron Waters; Directors, M. Beecher, J. A. Cadwallader, J. H. Eddy, Andrew J. Hazeltine, J. P. Jefferson, F. H. Rockwell, W. T. Schneider, Charles W. Stone, Thomas Struthers, L. D. Wetmore; Secretary and Treasurer, J. P. Jefferson.

Williamsport & Clearfield.—This company has elected Cornelius V. Sidell, President; C. S. Riley, Vice-President; Charles D. Ingersoll, Secretary and Treasurer.

PERSONAL.

—Mr. J. C. Carland has resigned his position as Train-Master of the Toledo, Ann Arbor & Grand Trunk road.

—Mr. P. Everts, for some time past General Superintendent of the Eureka & Palisade road in Nevada, has resigned his position.

—Mr. Wm. H. Vanderbilt is about to take a pleasure trip to and through California in company with several members of his family and a few friends.

—Mr. H. B. Libbie has resigned his position as Chief Train Dispatcher of the St. Louis, Keokuk & Northwestern and the Chicago, Burlington & Kansas City roads.

—Mr. Emile Low, formerly Chief Engineer of the Pittsburgh & Western, but for over a year past on the Mexican Central road, was married to Miss Estelle Reed, of Zelenople, Pa., the wedding taking place Jan. 23, in that town.

—Mr. Wm. Johnson, Master Car-Building in charge of the New York Central & Hudson River shops in Buffalo, died Jan. 21, aged 61 years. He had been with the company for many years.

—Mr. Julius Uihlein, who has been for many years Purchasing Agent of the Cincinnati Southern Railroad, has recently connected himself with the Cincinnati Railway Supply Company.

—Mr. John Given has declined the position offered him as Commissioner of the Southwestern Passenger Pool, preferring to retain his present office as Superintendent of the Keokuk & Des Moines Division of the Chicago, Rock Island & Pacific road.

—Mr. S. T. Fuller, recently Chief Engineer and Superintendent of the Mexican National road, has been presented by the officers and employés of the road with a valuable gold watch and an arm-chair made from the horns of Texan steers. His wife and daughter also received parting testimonials from their friends.

—Mr. J. H. Parsons, who recently resigned his office as Superintendent of the Western Division of the Lake Shore & Michigan Southern road to accept a position on the Chicago & Atlantic road, was recently presented with a valuable gold watch and chain by the officers and employés of the Lake Shore road.

—Mr. Edward I. Sanford has resigned his position as Secretary of the New York, New Haven and Hartford Co., after 16 years' service. He resigns on account of his position as a judge of a Connecticut court, a bill having been introduced in the Legislature forbidding judges to hold positions in any corporation.

—Mr. W. H. Dixon having resigned his position as Commissioner of the Western Trunk Lines Passenger Association, the Association at its last meeting passed the following:

"Resolved, That the resignation of Mr. W. H. Dixon as Commissioner be accepted. Greatly regretting Mr. Dixon's retirement from our service, we assure him of our entire satisfaction with his administration, and of our high appreciation of him as a gentleman and an officer, and wish him the fullest measure of success in all his future life."

TRAFFIC AND EARNINGS.

Cincinnati Passenger Agents.

A meeting of the general passenger agents of the roads entering Cincinnati was held in that city last week to investigate charges made that some of the roads were paying com-

missions on St. Louis tickets. No action was taken, but the whole matter was referred to an adjourned meeting.

It was resolved to form a permanent Cincinnati association, and a committee was appointed to prepare rules for its government.

Railroad Earnings.

Earnings for various periods are reported as follows:				
Year ending Dec. 31:	1882.	1881.	Inc. or Dec.	P. c.
Northern Central.....	\$5,800,176	\$5,443,700	I.	\$356,476 6.5
Net earnings.....	1,957,852	1,636,254	I.	321,598 18.2
West Jersey.....	1,106,870	985,526	I.	121,344 12.3
Net earnings.....	455,130	457,572	I.	2,442 0.4
Month of November:				
Grand Trunk.....	\$239,500	\$231,895	I.	\$7,605 16.9
Net earnings.....	105,700	70,430	I.	35,270 50.1
Month of December:				
Northern Central.....	\$490,003	\$470,623	I.	\$19,380 2.8
Net earnings.....	25,088	154,919	D.	129,831 81.5
West Jersey.....	72,931	63,227	I.	9,704 15.7
Net earnings.....	11,207		
Third week in January:				
Chi. & Eastern Illinois.....	\$37,565	\$36,998	I.	\$567 1.6
Chi. & Grand Trunk.....	52,582	51,359	I.	1,223 2.3
Chi. Mil. & St. Paul.....	322,000	313,704	I.	8,296 2.6
Chi. & Northwestern.....	394,067	372,342	D.	21,725 5.5
Hannibal & St. Jo.....	41,600	29,458	I.	12,142 41.7
Louisville & Nashville.....	256,940	215,340	I.	41,600 16.4
Northern Pacific.....	97,370	55,496	I.	41,874 42.7
St. L. & San Francisco.....	58,900	54,711	I.	4,189 7.7
St. P., Minn. & Manitoba.....	115,000	90,988	I.	24,012 26.5

Grain Movement.

For the week ending Jan. 20 receipts and shipments of grain of all kinds at the eight reporting Northwestern markets and receipts at the seven Atlantic ports have been, in bushels, for the past seven years:

Year.	Northwestern receipts.	Northwestern shipments.	Atlantic receipts.
1877.....	1,721,443	727,113	1,404,707
1878.....	3,513,465	2,488,529	3,517,023
1879.....	3,315,970	1,309,977	2,911,915
1880.....	2,123,288	1,129,030	2,384,258
1881.....	2,760,717	1,543,532	2,569,827
1882.....	4,725,738	2,663,712	1,964,158
1883.....	3,684,889	2,571,890	2,502,247

The receipts of the Northwestern markets for the week were larger than in the corresponding week of any previous last year, when, by the way, they were larger than had ever been known in a winter week before, though they were exceeded in each of the ten following weeks. The receipts this year, however, were the smallest this winter so far. The shipments of these markets were a little less than last year, but larger than in any previous year. They were 430,000 bushels less than in the previous week of this year, but with that exception are the largest since navigation closed. The Atlantic receipts were 535,000 bushels more than in the corresponding week of last year, but were slightly exceeded in 1881, and largely in 1878 and 1879. They were 556,000 bushels less than in the previous week of this year, and there have been smaller receipts but once since navigation closed.

The falling off from the previous week in Northwestern receipts was at Chicago and Milwaukee, some of the railroads to which were badly obstructed by snow during the week. There was an increase at every other place except Peoria and Duluth.

The receipts at New York during the week were the smallest since April.

Both at the Northwest and at the seaboard corn continues to be the leading grain received.

Of the 1,963,477 bushels of grain exported from the Atlantic ports in this week, 747,555 went from New York, 730,971 from Baltimore and 209,170 from New Orleans. From the two last named places more corn than wheat was exported. Of the 178,231 barrels of flour exported in the same week, 141,984 went from New York, 17,433 from Boston, and 13,810 from Baltimore.

For the week ending Jan. 24 flour and grain exports from the same ports have been:

	1881.	1882.	1883.
Flour, bbls.....	147,904	61,330	178,136
Grain, bus.....	2,101,331	1,171,936	1,745,512

Reducing flour to wheat the exports this year were 73 per cent. more than last year, and 8½ per cent. less than in 1881.

For the week ending Jan. 27 receipts and shipments at Chicago and Milwaukee were:

	Receipts.		Shipments.	
	1883.	1882.	1883.	1882.
Flour, bbls.....	128,654	190,261	101,271	177,743
Grain, bus.....	1,427,726	3,261,975	701,939	2,036,240

The decrease in receipts was 33 per cent. in flour and 56 per cent. in grain. The figures for shipment lack the Saturday shipments from Chicago this year, but this was evidently a great decrease. This was the week of heaviest shipments last year.

For the week ending Jan. 20 receipts at four Eastern ports were:

Bushels:	New York.	Boston.	Phila.	Baltimore.	Total.
1883.....	1,118,604	324,575	294,050	546,647	2,283,876
1882.....	1,118,132	376,648	280,650	101,042	1,876,472
P. c. of total:					
1883.....	49.0	14.2	12.9	23.9	100.0
1882.....	59.5	20.1	15.0	5.4	100.0

Philadelphia and Baltimore together received 36.8 per cent. of the whole this year, against 20.4 last year.

Petroleum.

The production of the Pennsylvania and New York oil wells for December is given as follows by Stowell's Petroleum Reporter, in barrels of 42 gallons:

	1882.	1881.	Inc. or Dec.	P. c.
Production.....	1,897,510	2,480,000	D.	582,490 23.5
Shipments.....	1,129,453	1,069,581	D.	840,128 42.7
Stock, Dec. 31.....	34,506,011	26,019,704	I.	8,486,307 32.6
Producing wells.....	18,000	18,300	D.	300 1.6

The production is the lightest reported since January, 1880, and was exceeded in every other month since that time, and also in September, 1879. Of the total the Alleghany District in New York furnished 19.6 per cent.; the Bradford District, 55.6; the Middle districts in Pennsylvania, 9.8; the Southern districts, 15.0 per cent., so that 75.2 per cent. came from the new northern fields.

The shipments were the lightest since February, 1881, and were exceeded in every other month of this year, in two months of 1881, in ten months of 1880, and in eight months of 1879.

There were 123 new wells completed during the month, and 12 dry holes, or unsuccessful attempts, while 125 new wells were begun.

The shipments for the month were to the following points:

	Barrels.	P. c. of total.
New York.....	384,534	34.0
Philadelphia.....	81,092	8.1
Baltimore.....	23,193	2.1
Cleveland.....	239,952	21.2
Pittsburgh.....	45,401	4.0
Local points.....	164,759	14.6
Refined in Creek refineries.....	180,522	16.0
Total.....	1,129,453	100.0

Of the shipments from the wells 520,796 barrels are reported by rail, and 608,657 barrels by pipe line. The heaviest rail shipments were 125,755 barrels by the Allegheny

Valley road and 124,224 barrels by the Philadelphia & Erie.

Shipments of oil refined at Creek refineries (reduced to its equivalent in crude) were: New York, 62,874; Philadelphia, 234; Baltimore, 6,786; Boston, 45,610; local points, 65,018; total, 180,522 barrels.

For the year ending with December the figures are as follows, in barrels:

	1882.	1881.	Increase.	P. c.
Production.....	30,455,222	27,375,509	3,079,713	11.2
Shipments.....	21,878,314	20,284,235	1,594,079	7.9
Stock, Dec. 31.....	34,596,612	28,019,704	6,576,908	33.0
Av. No. of produc- ing wells.....	19,027	16,668	2,359	14.1

The production is the largest ever reported in any year. The daily average production was 75,921 barrels in January, and rose gradually each month to 105,102 barrels in July, then declining sharply each month to 61,910 barrels in December.

The total monthly shipments varied more than the production; the heaviest were 2,402,970 barrels in July, the lightest, 1,129,443 barrels in December.

The stock, of course, increased in each month throughout the year, the production being greater than the shipments in each month.

The number of producing wells reported increased from 18,400 in January to 19,600 in August, and then decreased, apparently because of a more careful count of exhaust wells, to 18,000 at the close of the year.

Coal.

Coal tonnages for the week ending Jan. 20 are reported as follows:

	1883.	1882.	Inc. or Dec.	P. c.
Anthracite.....	343,831	364,557	D. 20,726	5.7
Semi-bituminous.....	85,685	102,500	D. 16,815	16.4
Bituminous, Penna.....	67,011	66,340	I. 671	1.0
Coke, Penna.....	65,406	57,102	I. 8,304	14.6

The anthracite market is very dull, and the companies are reported to be generally cutting prices in the effort to get rid of stocks on hand.

The coal tonnage of the Pennsylvania Railroad for the week ending Jan. 20 was: Coal, 161,659; coke, 65,406; total 227,065 tons. Of this tonnage 128,220 tons of coal and 42,296 tons of coke originated on the company's lines, 33,439 tons of coal and 23,110 tons of coke being received from other lines. The total tonnage carried this year to Jan. 20 was 684,123 tons.

Tonnages of Pennsylvania semi-bituminous and bituminous coals and coke, not heretofore reported, for the year ending Dec. 31 were as follows:

	1882.	1881.	Inc. or Dec.	P. c.
Semi-bituminous.....	527,768	301,707	I. 226,061	74.8
East Broad Top.....	92,519	85,768	I. 6,751	7.8
Tyrone & Clearfield.....	2,789,165	2,401,987	I. 387,178	16.1
Bellefonte & Snow shoe.....	232,698	128,263	I. 104,435	81.6
Total.....	3,114,382	2,616,018	I. 498,364	19.1
Bituminous.....	117,945	124,421	D. 6,476	5.2
Allegheny Region.....	1,274,116	982,293	I. 291,823	29.7
Penn and Westmoreland.....	368,124	296,229	I. 71,895	24.3
West Penna. R. R.....	112,085	29,548	I. 82,537	281.3
Southwest Penna. R. R.....	646,348	689,483	D. 43,135	6.3
Pittsburgh Region.....	2,920,041	2,290,260	I. 629,781	27.4

All these tonnages are over the Pennsylvania Railroad and branches, either originating on those lines, or received from other roads.

The coal tonnage of the Pennsylvania Railroad for the year was as follows:

	1882.	1881.	Increase.	P. c.
Anthracite.....	1,829,854	1,829,854	0	0
Semi-bituminous.....	3,511,368	6,793,743	1,474,616	21.7
Bituminous.....	2,930,137	2,415,563	473,224	19.6
Coke.....	2,888,787	2,415,412	473,375	19.6
Total.....	11,157,146	9,209,306	1,947,840	21.2

The tonnage for December (four weeks) was 959,285 tons of all kinds. This tonnage includes all passing over the road; with the new year the company has made an excellent change in form, the reports for 1883 showing what tonnage originates on the line of the road, and what is received from other lines.

Cumberland coal shipments for the week ending Jan. 27 were 24,057 tons. The total shipments this year to Jan. 27 were 126,558 tons.

Lake Superior Commerce.

The following is the statement of the number of vessels, etc., passing through the St. Mary's Fall Ship Canal to and from Lake Superior during the season of navigation:

	1882.	1881.	Inc. or Dec.	P. c.
No. of vessels.....	4,774	4,004	I. 770	19.2
Registered tonnage.....	2,468,088	2,092,957	I. 375,131	17.9
Average tonnage of each vessel.....	517	523	D. 6	1.1
Passengers carried.....	29,256	24,671	I. 4,585	18.6
Tons freight carried.....	2,029,521	1,567,741	I. 461,780	29.5

While there was a decrease in the average registered tonnage of vessels using the canal, there was an increase in the average tonnage of freight actually carried.

The chief items of the freight passing through the canal were:

	1882.	1881.	Inc. or Dec.	P. c.
Tons iron ore.....	987,060	748,131	I. 238,929	31.9
Tons iron.....	92,870	87,830	I. 5,040	5.7
Tons copper.....	25,409	29,488	D. 4,079	13.8
Tons coal.....	430,184	295,047	I. 135,137	45.8
Ft. lumber.....	82,783,000	58,877,000	I. 23,906,000	40.6
Barrels salt.....	176,612	65,897	I. 110,715	168.0
Barrels flour.....	344,044	605,453	D. 261,409	43.2
Bushels grain.....	4,201,085	3,824,803	I. 376,282	9.9
Tons miscellaneous.....	172,167	129,031	I. 43,136	33.4

The Marquette Mining Journal, from which we take these figures, says: "The very great value of the new canal and river improvement to commerce is seen in the handsome increase of 29 per cent. in the total amount of freight passed through the new lock in the very first year after its completion—a percentage which will be further increased the present year, should there be a fair demand for the iron, copper and lumber product of the Lake Superior regions. The effect upon the ore traffic is visible in an increased tonnage equal to 32 per cent. through the canal; indeed, the only decrease was in copper and flour—the falling off in the former being accounted for by the large amount shipped by rail via Chicago and St. Ignace last winter, and the decrease in flour being due, probably, to the burning of the mills at Minneapolis."

Chicago Lumber Receipts.

The receipts of lumber and shingles at Chicago for the past two years have been as follows, in thousands of feet:

	1882.	1881.	Increase.	P. c.
Lumber.....	2,216,341	1,908,524	299,817	11.0
Shingles.....	954,549	806,075	148,474	10.2

Of the total receipts of lumber about 11½ per cent. came

by rail, and this evidently was chiefly hard-wood and Southern pine, as it was brought chiefly by railroads which do not reach the white pine. (The Chicago & Eastern Illinois brought more than any other road.) About 9 per cent. of the shingles was received by rail, and nearly one-half by the Chicago & Northwestern. Nearly one-half of the whole number last year (1,030,000 thousand), was brought from Lake Michigan ports, all included in 90 miles of the eastern shore: Manistee, Ludington, White Lake, Muskegon and Grand Haven. From Green Bay came about 420,000. There were some receipts from the distant Lake Superior ports—20,500 from Ashland and Duluth.

Southern Railway & Steamship Association.

The following circular has been issued by General Commissioner Virgil Powers, under date of Jan. 27:

"The Rate Committee at its late session unanimously agreed that there should be issued by me an order to all lines, members of, or working with, the Association, 'providing that they require from their connections on all shipments from beyond their lines full information of the initial point, rates guaranteed and divisions of said rates, and in the event of property being offered at divisions giving less than the rates issued by this Association, that the property be declined or charges cut back so as to allow full Association rates from point of contact.'"

"This was especially intended to govern business from points north of the Ohio River."

"I therefore now advise you of the action of the Rate Committee, and call upon you to require your connections to enter on all way-bills, initial point, rate guaranteed, and divisions of said rate, and in all cases where this is not done, instruct your agents to decline goods, or cut back the charges so as to give full Association rates as directed in the above extract from the proceedings of the Rate Committee."

Steamer Emigrant Rates.

In consequence of the competition of what are known as the "outside" lines of steamers—namely, those which do not belong to the North Atlantic and Continental steamship conferences—the latter lines have reduced their emigrant rate from Liverpool, etc., to New York from \$28 to \$21, while the outside lines generally charge \$1 less. The new rates from the several European ports are:

From—	Confer- ence.	Out- side.
Liverpool, Queenstown, Glasgow, Belfast or Lon- derry.....	\$21	\$20
Dublin.....	22	21
London, Bristol or Cardiff.....	24	20
Hamburg, Havre, Antwerp, Rotterdam, Amster- dam, Paris, Bremen and Stettin.....	27	25
Scandinavian ports except Stockholm.....	28	25
Stockholm.....	33	28

The rates from New York to these ports are not changed. The conference lines pay agents a commission of \$2 for Bristol and \$3 for Continental passengers; the outside lines pay a dollar more. The reduction in the rate if applied to the total immigration of last year would have amounted to \$5,000,000. This is the season when emigration is lightest, but there may be many tickets sold now for emigrants who will sail in the spring.

Williamsport Lumber Traffic.

The very considerable business of Williamsport may be seen by the following statement of its timber shipments for the last two years:

	1882.	1881.	Inc. or Dec.	P. c.
By Philadelphia & Erie.....	122,292	108,093	I. 14,199	13.0
By Philadelphia & Reading.....	124,044	98,934	I. 25,020	25.0
By Canal.....	15,045	20,048	D. 5,003	42.0
Total.....	261,381	231,068	I. 30,313	18.0

The total shipments in 1880 were only 172,155 thousands, so the increase since then has been 52 per cent., making last year 20,603 car-loads, besides the canal shipments.

Chicago Board of Trade and the Railroads.

The railroads from Chicago to the East have become involved in a controversy with the Chicago Board of Trade, due to their refusal to submit claims of shippers to the arbitration of the Board. These roads have had contracting agents on the Board, who took orders for shipments of members. A member claimed damages of the Pennsylvania Company for injury to goods shipped, due, as he claimed, to the carrier's negligence. The member appealed to the Arbitration Committee of the Board, but the railroad company refused to submit to this arbitration. The Board of Trade bases its claim to arbitrate contracts for transportation made on the Board (the same as contracts between dealers in grain, etc.) on the following paragraph on the ticket of admission to the Board which is given to the railroad agents.

"This ticket is issued on the theory that the business contemplated to be transacted by the holder is mutually beneficial to the members of the Board of Trade and to the party to whom it is issued, or his employer, and is forfeitable for a violation of decorum on the part of the holder, in case it is presented by any other than the party named on its face, or if the holder is found transacting any business not contemplated by the issue of the ticket, or in case the party holding it, or his employer, fails to fulfill any commercial agreements that would render a member of the Board of Trade liable to discipline."

The Pennsylvania Company refusing to submit to the award of the Arbitration Committee, it was denied the privileges of the Board. Thereupon all the lines to the East withdrew their agents from the Board, and united in the following communication to its Secretary, which is dated Jan. 26:

"I am requested by the representatives of the following roads centering in Chicago to state that the order suspending the representatives of the Pennsylvania Company from the privileges of your Board implies that the representation of any road upon the floor of your Board is authorized only upon condition that the roads recognize the arbitration rule of your Board as applying to transactions between the members of your Board and their agents."

"All the roads represented decline to recognize the authority of this rule, and will therefore discontinue the practice of sending their agents upon your floor. Yours very respectfully,

THOS. C. MOORE, Chairman.

"On behalf of the Michigan Central R. R., Pittsburgh, Cincinnati & St. Louis Ry., Baltimore & Ohio R. R., Chicago & Eastern Illinois Ry., Chicago & Grand Trunk Ry., Lake Shore & Michigan Southern Ry., New York, Chicago & St. Louis Ry., Pennsylvania Company, Green Line, Cincinnati, Indianapolis, St. L. & C. Ry., Kankakee Line, Southern Dispatch Line, Chicago & Louisville Southern Line, Louisville, New Albany & Chicago Ry."

The railroads have also discontinued the reports of shipments formerly made to the Board of Trade.

RAILROAD LAW.

Minnesota Railroad Legislation.

Several bills have been introduced in the Minnesota Legislature relating to railroads. The principal one provides for a railroad commission of three members with extensive powers of regulation and supervision, in place of the pres-

ent single commissioner. Other bills have been introduced regulating passenger fares and freight rates and providing penalties for discrimination against towns and individuals. It is said that the commission bill stands a fair chance of passing.

Railroad Taxation in New Jersey.

The report of the commission appointed last year on railroad taxation is before the New Jersey Legislature and there will be considerable discussion on the question, but probably little action. Under the present law the taxes on railroad property are paid directly to the state, and the complaint is made that a very large part of the property of the roads escapes local taxation. This is especially the case in Jersey City, where the railroads own very valuable terminal property. The trouble is that many of the older charters contain clauses regulating taxation which are in the nature of contracts, and that the framing of any general law would be very difficult, if not impossible.

Trustees Not Liable as Stockholders.

In Burgess against Seligman and others, plaintiff held a judgment against the Memphis, Carthage & Northwestern Co., whose property was sold under foreclosure several years ago. He then brought suit to recover from defendants, claiming that they were liable as holders of a large amount of stock on which full payment had not been made. The United States Supreme Court has just affirmed the decision of the lower courts, holding that defendants are not liable, the stock of the company having been conveyed to them as trustees and by way of further security for the company's bonds only, and that they held it as trustees and custodians only.

OLD AND NEW ROADS.

Addison & Northern Pennsylvania.—The New York and Pennsylvania corporations of this name have been consolidated and are now one company in law, as they have always been in fact.

Atchison, Topeka & Santa Fe.—It is said that this company is considering the question of building a branch from some point in New Mexico into Texas, and possibly to Austin.

Atlantic & Pacific.—Tracklaying is progressing steadily on this road and the rails are reported down to a point 12½ miles west of the late terminus at Yampai, Arizona, and 463.8 miles from Albuquerque. The work has been somewhat delayed by the recent snow-storm, which extended much further south than usual.

Boston, Concord & Montreal.—Application will be made to the New Hampshire Legislature for a charter for a branch of this road from Tilton or Northfield to connect with the Northern Railroad in Franklin.

Boston, Hoosac Tunnel & Western.—The stockholders of the Continental Construction Co. have ratified the action of the directors in selling the franchises and property of this road west of Schenectady to the New York, West Shore & Buffalo Co.

Battleboro & Bennington.—The town of Wilmington, Vt., has voted to subscribe \$44,000 in aid of this projected road.

Camden & Atlantic.—The Philadelphia Ledger says: "The Camden & Atlantic and the West Jersey & Atlantic Railroads, we learn, will be worked between Camden and Atlantic City in harmony during the approaching season. The majority of the stock of the former road being now held by shareholders in sympathy with the Pennsylvania road, which controls the latter, the Camden & Atlantic Co. will, at the approaching annual election, pass practically under Pennsylvania control, yet in such a way as not to conflict with any of the provisions of the New Jersey laws upon the subject of competitive lines. There will be harmony secured in charges, however, and no rate cutting hereafter. The regular passenger traffic will be concentrated so far as possible at Market street wharf, while Vine street wharf will be availed of to accommodate the enormous excursion traffic to Atlantic City. The tracks of the two companies are to be made interchangeable, so that trains can go on either line from either station, and other improvements are contemplated. One of the most important results following from this will be the control of traffic from New York and adjacent points to Central and South Jersey and Philadelphia which has been passing over the Central and Southern New Jersey roads and the Camden & Atlantic. This will pass under Pennsylvania Railroad auspices again by the new arrangement. There is much secrecy observed in the preparations for these new traffic arrangements, but the above is substantially what is contemplated."

Canada Southern.—Books were opened last week for subscriptions to the stock of the company which is to build the new bridge over the Niagara River for this road. The stock was all taken by Mr. Wm. H. Vanderbilt and parties connected with him. The bridge, it is said, will be built about 300 ft. above the old Suspension Bridge, and will be a steel arch bridge, for railroad tracks only, with no carriage-way.

Canadian Pacific.—This company has made a contract with a large Glasgow firm for the construction of three steel steamers to run between Algoma and Thunder bay. A contract for two additional steamers will be given out when the building of the three first contracted for is somewhat advanced.

The company offers \$10,000,000 of its new stock to subscription through J. S. Kennedy & Co., of New York, and A. Boissevain & Co., of Amsterdam, Holland. Under Canadian law dividends of 5 per cent. annually will be paid until the work of construction of main line is finished. The stock can be paid for in three installments, on February 10, March 10 and April 10, and no bid less than 60 will be accepted.

Cape Fear & Yadkin Valley.—A bill has been introduced in the North Carolina Legislature providing for the transfer of the state interest in this road to Julius A. Gray and others, upon condition that they complete the road to Greensboro.

Carson & Colorado.—This company's line is completed, and open for business, to Benton, Mono County, Cal., a distance of 193 miles from Mound House (junction with Virginia & Truckee Railroad), and will be extended during the coming spring and summer through the Owen's River Valley to the lower end of Owens Lake.

Passenger trains make close connection at Mound House with trains of the Virginia & Truckee, which connect at Reno with east and west-bound trains of the Central Pacific.

The road is intended to run through to a junction with the Southern Pacific at Mohave, Kern County, Cal., some 200 miles beyond Benton. It is expected to reach this year, the lower end of Owen's Lake, in Inyo County. The line is generally through the open country on the eastern slope of the Sierra Nevada, traversing the valleys of Carson, Walker and Owen's rivers, and serving a country generally fertile

and well watered. It will also give access to several mining districts whose progress has hitherto been checked by their remoteness from all railroad communication.

Carolina Central.—It is said that the complainants in the Matthews suit (in which Mrs. Virginia Matthews, of New York, seeks to set aside the last reorganization of this company and, as a collateral issue, the recent transfer of the controlling interest in the road to the Raleigh & Gaston and the Seaboard & Roanoke) are dissatisfied with the progress made in the courts, and will appeal to the North Carolina Legislature for some settlement. Precisely in what way this will be done is uncertain.

Carolina, Cumberland Gap & Chicago.—Arrangements have been made to begin work near Aiken, S. C., on this projected road.

Central Iowa.—The Peoria & Farmington Division is completed to Monmouth, Ill., 5 miles westward from Phelps, the terminus at the end of the year, and 66 miles from Peoria. About 26 miles remain to reach the Mississippi at Keithsburg.

Central, of New Jersey.—It is stated that this company has made a contract giving the Lehigh Valley the use of a short section of its track near Bound Brook. The particulars of the contract are not made public.

Central Vermont.—The Boston Advertiser of Jan. 30 says: "The signatures of bond and stockholders of the Vermont Central and the Vermont & Canada to the scheme for the reorganization of the Central Vermont are coming in very rapidly at the office of the American Loan & Trust Co., and its officers believe that there is no doubt of the success of the plan. It is stated that a large proportion of the trust securities held by the Central Vermont managers, hitherto held back, have been handed in, and there seems to be no reason to anticipate a failure of the negotiations. Only a day or two more remain for the assent of the security-holders under the extension of time granted by the Trust Co."

A dispatch from Boston, Jan. 31, says: "The time expired to-day for the trust debt exchange in the Vermont & Canada and Vermont Central reorganization scheme. So far as this portion of the proposed arrangement is concerned a large majority has been secured of the \$4,357,000. Of this trust debt, comprising the equipment, income and extension, guaranteed, and Stanstead, Shefford & Chambly bonds, between \$3,400,000 and \$3,500,000 has come in. In order to fully carry out the plan of settlement, however, a majority of the Vermont & Canada stock, and first and second mortgage bonds of the Vermont Central must be secured. The Hon. F. A. Brooks, President of the Vermont & Canada road, who holds the balance of power, has expressed his willingness to subscribe to them. This done, there will be no difficulty in securing for the company, under the plan of organization, a clear title to the property."

Chesapeake & Ohio.—This company is building at Newport News, Va., an elevator with a storage capacity of 1,500,000 bushels of wheat. The elevator building is to be 400 ft. long by 100 ft. wide and 156 ft. high. The foundation consists of 2,500 piles driven in clusters of nine piles each, driven 20 ft. in the ground, and sawed off level at high-water mark. The piles are capped with oak timber and filled in between them by grouting to the level of the oak caps, and on this foundation the corner-stone was laid Jan. 17. There are to be 264 piers of stone 9 ft. high and 6 ft. 6 in. at the base, on which the walls of the building will rest. The walls will be constructed by laying 2 in. planks flat one piece upon another, and the bins will be constructed in the same manner.

Chicago & Alton.—In the suit between this company and the Wiggins Ferry Co., the United States Supreme Court has decided that the case is not one properly under the jurisdiction of the Federal courts, and that it must be remanded to the state court in which it originated. This sustains the previous decision of the United States Circuit Court.

Chicago, Burlington & Quincy.—The Clinton Branch has been extended from East Clinton, Ill., northward to Fulton, 2 miles.

Chicago & Northwestern.—This company is having surveys made for a line from Gladbrook, Ia., to Anamosa, about 90 miles. A line has also been run for an extension of the Maple River Branch from Holstein to Sioux City, about 50 miles. Some 10 miles of this extension is graded.

Cincinnati & Eastern.—This company has begun proceedings to condemn what is known as the old tunnel property in Cincinnati. The intention is to complete the tunnel, which was begun many years ago, but never finished, and which will carry the road through the hill into the Deer Creek Valley, giving it an entrance into the city through that valley. The terminus will be near the present station of the Cincinnati Northern, with a spur connecting with the Pittsburgh, Cincinnati & St. Louis tracks. The tunnel required will be about 10,000 ft. long; of this some 3,000 ft. were cut through, but the work has been abandoned for years and is now in a ruinous condition.

Cincinnati, New Richmond & Maysville.—This company has been organized to build a branch of the Cincinnati & Eastern road from New Richmond, O., by Felicity to Aberdeen, opposite Maysville, Ky. The line will be about 40 miles long.

Denver & New Orleans.—Argument was heard before the United States Circuit Court in Omaha last week in the suit brought by this company to compel the Atchison, Topeka & Santa Fe to exchange business with it on the same terms as with the Denver & Rio Grande. A large amount of testimony, covering 500 pages of printed matter, has been taken. This testimony is directed almost exclusively to questions of custom and usage of the country with respect to through traffic, and a large number of the leading railroad men of the country have testified.

Denver & Rio Grande.—Some change in the directory of this road seems to have been thought necessary, and accordingly Messrs. A. J. Cassatt, Peter Geddes, L. H. Meyer and Wm. L. Scott have been chosen to the board. These gentlemen are all well known as railroad men and financiers, but have not been, until recently, known as large stockholders in this company. Mr. Geddes' election may be taken to indicate some understanding with the Chicago, Burlington & Quincy, in which he is a director.

Deposit & Syracuse.—It is proposed to build a railroad from Deposit, N. Y., on the Erie road, north by west to Syracuse, about 90 miles. The line proposed is about midway between the New York, Ontario & Western and the Syracuse, Binghamton & New York, and passes through some pretty rough country.

Detroit, Indiana & St. Louis.—This company has been organized to build a railroad from Fayette, O., across Indiana and to Bloomington, Ill., a distance of about 280 miles.

Fitchburg.—At the annual meeting, Jan. 30, the directors were authorized to issue bonds to the amount of

\$500,000, payable in 20 years from April 1, 1888, bearing interest at the rate of 5 per cent. per annum, in order to provide means for funding the floating debt. The directors were authorized to request the Vermont & Massachusetts Co. to issue its bonds to an extent not exceeding \$1,000,000 for the purpose of paying the bonds of that company falling due in July next, and also to be applied toward the payment of the Fitchburg Railroad Co. for the improvements made on the Vermont & Massachusetts Railroad.

Flint & Pere Marquette.—A meeting of the holders of the common stock of this company was held at Boston, Jan. 25. J. S. Knapp, of New York, presided, and 20,000 shares were represented. A dispatch from Boston said: "After a full discussion, the sense of the meeting was declared by a formal vote to be in favor of submitting two plans to the directors for removing the present disability of the common stock. One plan is that new capital stock of about \$8,000,000 be issued, the preferred to be exchanged share for share, and the common two shares for one of the new; and the other plan is that common stock holders surrender one-third of their present holding in consideration that there be issued to them 66 2/3 per cent. of new common stock, that shall participate in the management of the company and receive the surplus of the net earnings annually after 7 per cent. dividend has been paid on the preferred stock. Under the first plan the capital stock is reduced \$1,600,000. It was stated that the earnings of the year would be sufficient to pay 8 per cent. on the entire reduced capital of \$8,000,000, and it was argued that it would be to the advantage of the preferred stockholders to consent to this reorganization, for under the present management they cannot for five years receive more than 7 per cent. The second plan proposes to maintain the preference of the preferred stock, but to remove the disabilities of the common stock—which are that it can neither participate in the management of the company nor share in the earnings until the preferred stock has received five consecutive dividends of 7 per cent."

Gainesville, Jefferson & Southern.—A considerable amount has been subscribed to the stock of this company for the branch from Jefferson, Ga., to Athens. The proposed line is an easy one, and can be cheaply built.

Galveston, Harrisburg & San Antonio.—This road now includes the entire Southern Pacific line from El Paso, Tex., to Vermillionville, La., the Texas & New Orleans and the Louisiana Western having been placed with it under the same officers and the same management.

Harrisburg & Western.—This company has been organized to build a railroad from Harrisburg, Pa., through the Cumberland Valley and thence westward to a connection with the Pittsburgh, McKeesport & Youghiogheny road in Allegheny County. It is in the interest of the South Pennsylvania project, and the new organization seems to have been made to cover some changes in the proposed route of the road.

Illinois Northern.—This company has filed articles of incorporation to build a railroad from Peoria, Ill., by Sterling to Milwaukee. It is a revival of an old project.

Indiana, Bloomington & Western.—It will be remembered that after this company had leased the Cincinnati, Sandusky & Cleveland road for 33 1/3 per cent. of the gross earnings, a dispute arose in relation to the interpretation of a part of the lease. The section of the road from Springfield, O., to Dayton was leased years ago to the Cleveland, Columbus, Cincinnati & Indianapolis as part of its Cincinnati line, the rental being a per centage on the gross earnings. The question at issue was whether the gross earnings of this leased section or only the rental received for it should be included in computing the 33 1/3 per cent. to be paid by the Indiana, Bloomington & Western Co. It was mutually agreed to leave the question to the courts for decision, and a friendly suit was begun in the Court of Common Pleas at Springfield, O. That Court has now decided in favor of the lessee's view, that only the rental received is to be included in the gross earnings on which rent is computed.

International Railway & Improvement Co.—This company has declared a final division of its assets as follows: 25 per cent. Missouri, Kansas & Texas general mortgage bonds; 22 per cent. Missouri, Kansas & Texas stock; 15 per cent. in scrip, convertible into stock of the Mexican, Oriental & Inter-oceanic Railway Co., when that road is completed; stockholders of International Railway & Improvement Co. have the privilege of subscribing to extent of 50 per cent. of their holdings to stock of Oriental Construction Co.

The International Co. is the construction company which has built the extensions of the Missouri, Kansas & Texas road in Texas.

Kansas City, Ft. Scott & Gulf.—The General Passenger Department of this road has issued the following circular, which is dated Kansas City, Mo., Jan. 23: "The Memphis Extension of this line is now completed, and regular trains running to West Plains, Howell County, Mo., 315 miles from Kansas City. The line will reach Augusta, Oregon County, Mo., about Feb. 20, and will be completed and open for business to Memphis, Tenn., about June 1, 1888."

Lebanon Springs.—It is reported that negotiations are pending for the sale of this road to the New York, West Shore & Buffalo Co., the object being to use part of the road as a portion of a connecting line between the West Shore road and the Hoosac Tunnel. The road is now in possession of a receiver.

Little Rock, Mississippi River & Texas.—This company defaulted on the interest due Jan. 1 on its first mortgage bonds, and the bondholders are asked to fund their coupons for two years, in order that the earnings may be applied to the payment of the floating debt incurred for the extension of the road. The immediate cause of the default is the loss of earnings and the extra expenses caused by the heavy wash-outs of the road during the floods of last summer.

A suit has been begun in the United States Circuit Court at Little Rock to compel payment of the Arkansas state bonds issued in aid of this road and afterward repudiated by the state. There were \$1,200,000 of these bonds issued to the Little Rock, Pine Bluff & New Orleans and \$600,000 to the Mississippi, Onachita & Red River, both of which roads came into possession of the present company through foreclosure of other mortgages. The suit is based on the recent decision in the Little Rock & Fort Smith case.

Louisville, New Albany & Chicago.—This company has made arrangements to use the Chicago & Atlantic track for about 1 1/2 miles from Hammond, where the connection with the Chicago & Western Indiana is made. This arrangement is made to avoid an inconvenient crossing.

Massachusetts Central.—A circular has been issued by this company, of which the essential part is as follows: "It will be necessary to obtain from the Legislature of Massachusetts, at its present session, an extension of time for the completion of the Massachusetts Central Railroad; and the directors propose, in connection with this application, to request authority for such action on the part of the

company, as will enable it to procure the means to pay its indebtedness, and to finish its road as contemplated by its charter, or, by uniting with other corporations, to construct, in addition to the original line, a road which will give a new route from the city of Boston via Holyoke, Westfield and Great Barrington, to the city of Poughkeepsie, on the Hudson River. The money required for either of these objects can be obtained only by the issue of bonds, which shall be a first lien upon the franchise and other property of the company; and this will necessitate the cancellation of the existing mortgage, and the conversion of the outstanding bonds into a form of security which shall rank second to those upon which the money is to be raised. * * * The directors recommend the adoption of the plan embodied in the following memorandum:

"First.—The holders of the outstanding bonds and coupons shall, on or before March, 1888, deposit the same with the New England Trust Co., of the city of Boston, which shall act as the custodian thereof, and will issue to the depositor a negotiable receipt, reciting the trusts and conditions under which such bonds and coupons are deposited.

"Second. The holders of such receipts will receive in exchange therefore, when authorized, preferred stock, which shall stand next after the first mortgage bonds hereinafter mentioned, at the rate of 10 shares of \$100 each for every bond and one share for every \$100 of overdue coupons so deposited; any fractional parts of coupons to be represented by scrip, which shall be convertible into preferred stock upon presentation of \$100 in amount thereof. This preferred stock shall be entitled to dividends not exceeding 8 per cent. per annum, if earned, and the same are to be paid before any earnings shall be divided upon the common stock.

"Third. The common stock shall relinquish its voting power and control of the corporation, until the preferred stock shall have received 8 per cent. dividends in any one year.

"Fourth. There shall be issued 7 per cent. gold bonds, having 30 years to run, to the amount of \$25,000 per mile of railroad, if necessary, the same to be secured by a first mortgage upon the property and franchise of the company. These bonds shall be redeemable at the option of the company, at any time after 10 years from their date, by the payment of not exceeding 10 per cent. premium, and the interest due thereon; and they will be offered at par to the holders of preferred and common stock for a period of 30 days, under such regulations as shall hereafter be made by the directors, before being placed upon the market, or otherwise offered for sale.

"Fifth. There shall be a managing committee, to consist of Samuel N. Aldrich, President of the company, and Messrs. Thomas H. Perkins and Henry Woods of the board of directors, who shall arrange and carry into effect the details of the plan herein set forth. This committee shall have full power to represent the company, and the members thereof shall be the attorneys in fact of the parties depositing their bonds and coupons, and of the holders of the receipts issued therefor, and shall be authorized to purchase and hold, for their account, the property covered by the existing mortgage, in the event of a sale thereof."

An agreement to the foregoing plan will not be binding until the owners of three-quarters in amount of the outstanding bonds shall have subscribed thereto; and in order that no advantage may be gained by the holders of bonds not surrendered, the bonds so deposited shall not be cancelled until the preferred stock is issued and the plan perfected.

It is understood that should the reorganization herein contemplated be confined to the present chartered limits of the Massachusetts Central Railroad Company, or such extension thereof as shall be obtained from the Legislature, then the preferred stock and new bonds shall be issued by that company or (in the event of a sale under the existing mortgage) its successor. But should a consolidation be effected with another railroad corporation or corporations, for the purpose of enlarging the railroad, then the outstanding bonds and coupons of such other corporation shall be retired, and preferred stock issued therefor; the result of such consolidation being the formation of new corporation, with preferred stock consisting of the present outstanding bonds of the corporation.

Memphis & Charleston.—No conclusion has been reached in the matter of the surrender of the lease of this road by the East Tennessee, Virginia & Georgia Co. The probability at present seems to be that the lease will continue.

Memphis & Little Rock.—A dispatch from Little Rock, Ark., Jan. 30, says: "Last year R. K. Dow, and other mortgagees of the Memphis & Little Rock Railroad paid \$250,000 to satisfy a mortgage held against the company by the State for \$100,000 loaned in 1860 and interest thereon. Dow then brought suit against the railroad company to compel it to refund the amount paid. Judge Caldwell of the United States Court, to-day decided that the company must repay the money."

Memphis, Selma & Brunswick.—This company has executed a mortgage for \$6,000,000 to the Trust & Safe Deposit Co., of Philadelphia, as trustee. The mortgage covers the entire line from Memphis, Tenn., by Holly Springs, Miss., to the Alabama line, 175 miles. About 75 miles of the road are graded.

Mexican Central.—The following circular is issued from the office of the Mexican Central Co.:

"This company has constructed its main line from the City of Mexico north 321 miles, from Paso del Norte south 265 miles, and on the Tampico line 60 miles, making the total amount of road constructed, up to our last report from Mexico, 646 miles.

"The survey made by our late Chief Engineer, Mr. Morley, shows that the length of the main line is only 1,231 miles, instead of 1,300 miles, as before estimated. This will reduce the cost about \$1,311,000.

"This survey further shows that we can safely reduce the estimated cost of the line from Chihuahua to Zacatecas, 561 miles, from \$19,000 per mile, as estimated in our circular note dated Feb. 23, 1882, to \$17,000 per mile, amounting to \$1,122,000, and making a total reduction in cost of \$2,433,000.

"With this reduction I am satisfied that the call under this circular will be sufficient to complete the main line, with sufficient rolling stock to operate the same one year from the date of completion.

"The board consider it of the highest importance to complete the main line at the earliest date possible, and Messrs. Fink and Robinson express the opinion that this work can be accomplished in the first quarter of 1884.

"To insure this result, the board have resolved to raise the sum of \$6,032,500 at this time, and they now offer to subscribers under circular No. 1, or their assigns, who hold subscription rights, the first right to subscribe for that amount, each right-holder under said circular being entitled to subscribe for a number of blocks equal to the rights held by him under circular No. 1.

"After payment of the first 10 per cent., no further calls will be made until the subscription under circular No. 3 is exhausted, which will probably be about June, 1883.

"For \$4,750 in cash, payable 10 per cent. in ten days from date of acceptance, and the balance as the same may be

called, but no more than 15 per cent. in any one month, the company will deliver to the subscribers 40 shares of the capital stock at its par value of \$100 per share, \$5,000 in its 30 year 7 per cent. first-mortgage bonds and \$1,000 in its income bonds.

"All subscriptions must be made in sums of \$4,750, or multiples thereof, and must be received at this office on or before Monday, Feb. 5, 1883, at 2 o'clock, at which time all rights hereunder will cease.

Any amount remaining unclaimed at that date will be disposed of as the directors may think for the interest of the company."

Midland North Carolina.—The Best syndicate, controlling this company, has petitioned the North Carolina Legislature to grant the company the state stock in the Atlantic & North Carolina road, on condition that the Midland road shall be completed from its present terminus at Smithfield to Salisbury within a reasonable time.

Nashville, Chattanooga & St. Louis.—On the extension of the Jasper Branch from Victoria, Tenn., to the Inman ore bank, which is 5 miles long, there are 4,500 ft. of trestles. There are 13 trestles in all, the longest being 600 ft. long and 50 ft. high, at Camp Ground Hollow. The piles used are all of cedar.

New York & Boston Inland.—A Hartford dispatch speaking of this company in Connecticut says: "Now, as last year, the claim in Massachusetts is that this alleged road has a 'charter' from Connecticut. All the franchise it possesses here is what it may possibly possess hereafter by conforming to the railroad law. It has only so far filed an application, dated Feb. 4, 1882, and the report of its engineers is very brief. Upon an examination of the papers in the secretary of state's office the enterprise does not assume magnificent proportions, except as a paper scheme. The capital stock is placed at \$10,000,000. George Cook of New Haven subscribes for five shares, and several fellow-townsmen for three shares each. In all are 80 shares subscribed for by 26 Connecticut people, who are not generally known, and none of whom have ever been suspected of being large capitalists, and these are all of the subscribers, with a single exception, this being, as entered, 'The New York Construction Co., Boston, by A. W. Boardman, its Treasurer, duly authorized by vote of the directors, 6,120 shares.' Two engineers furnish estimates of cost. From the New York state line to Middletown, on the Connecticut River, the amount given is \$10,000,000; from Middletown to the Massachusetts state line in the town of Thompson, \$8,250,000. Here are \$18,250,000 for Connecticut alone, upon which speculators can, perhaps, figure the additional millions which it will take to construct the whole line."

The company certainly does not appear to be on a very solid basis as yet. It will evidently meet with very strong opposition from the New York, New Haven & Hartford Co.

New York, Chicago & St. Louis.—At the annual meeting in Cleveland, Jan. 30, it was resolved to change the date of the meeting to the first Monday in May. The next meeting will accordingly be held in May, 1884.

It was voted to authorize the issue of \$10,000,000 second-mortgage bonds, for the purpose of funding floating debts, etc. It is understood that only \$3,000,000 will be offered for sale at present.

It is announced that through trains will not be put on until the ballasting of the western end of the road is finished and arrangements completed for terminal facilities in Buffalo and Chicago.

New York & New England.—The board has voted to issue \$1,250,000 of the new second-mortgage 6 per cent. bonds, of which \$500,000 will be used for the purchase of 15 locomotives, 20 passenger cars, 100 box and 500 coal cars, and the balance for the completion of the second track from Boston to and beyond Hartford.

The transfer steamer "Maryland," which has been off duty for about two months, will be put on again Feb. 11, when the Washington, Philadelphia & Baltimore line from Boston will be resumed. The steamer has been thoroughly overhauled, the engines having been taken out and completely repaired; the boilers have received a thorough inspection and testing, the deck timbers and floors have been renewed and many other repairs have been made. It is expected that certain improvements introduced will add to the speed of the vessel. The new time-table will shorten the time between Boston and Washington, so that, starting from Boston at 6.30 p. m., Washington will be reached at 11.17 the next forenoon. Pullman sleepers are to be run from the Grand Central Depot, New York, in connection with the return train from Washington; leaving New York at 11.35 p. m., they will reach Boston at 7.35 the next morning. The new arrangement will also give greatly increased postal accommodations to Boston merchants.

New York, New Haven & Hartford.—Vice-President Reed says that this company has nearly completed the purchases of land for the two extra tracks from New Rochelle to Stamford, Conn., and that contracts for constructing the roadbed will be let within a few days. When the new tracks are laid they will be used for passenger trains, and the two old tracks for freights. The new road will be stone ballasted, and all of the present grade crossings will be run under or over. All of the present heavy grades, which vary from 30 to 50 ft. to a mile, are to be cut down to 26 ft., it being the intention to use the new tracks entirely until the old tracks are brought down to a level with the new passenger tracks.

Northern Central.—This company's statement for December and the year ending Dec. 31 is as follows:

	December.	Year.
Earnings.....	\$490,003	\$5,800,176
Working expenses.....	345,032	3,386,192
Extraordinary expenses.....	116,283	456,131
Total expenses.....	\$461,315	\$3,842,323
Net earnings.....	\$28,688	\$1,957,853

For the year there was an increase of \$356,476, or 6.5 per cent., in gross earnings; an increase of \$54,878, or 1.5 per cent., in total expenses; and an increase of \$301,598, or 18.2 per cent., in net earnings. There was an increase of \$56,298 in working expenses, which include improvements of road and equipment.

Northern Pacific.—The St. Paul Pioneer-Press gives the following statement of the condition of the branch lines in Minnesota and Dakota: "The Fargo & Southwestern has just been completed to Lisbon, and is graded to La Moure, which will be the division terminus and the county seat of La Moure County. The survey of this line has been extended to the Missouri River. The James River Navigation Co. is now arranging for the navigation of the James River between La Moure and Columbia, a distance of 65 miles. The business will be done by two steam tugs and the necessary barges built canal-boat style. The James River in this distance of 65 miles is in its natural state, at low water, about 150 ft. wide, and from 4 to 10 ft. deep, with scarcely any current, so that a small tug will tow a barge fleet at small expense. The Jamestown Northern is a branch located

from Jamestown in a northwesterly direction to the Mouse River, distance about 140. At Carrington, 40 miles northwest of Jamestown, to which place the branch was finished during the past season, is the junction of the Devil's Lake & Turtle Mountain line, which line, leaving the main branch at Carrington Junction, runs due north via the west end of Devil's Lake and through the Turtle Mountain country to the international boundary, a distance of about 125 miles. Work will be continued on these branches in 1883. The extension of the Northern Pacific, Fergus Falls & Black Hills line in Dakota has been pushed west from Wahpeton 40 miles, the track being laid on the grade that was purchased from the Manitoba Railroad Co. in the branch deal. This line will be continued in a southwest direction towards the Missouri River and Black Hills, and probably be pushed to completion as fast as the settlement of the country through which it is located will justify."

Pennsylvania, Slatington & New England.—This company has begun suits against the Wind Gap & Delaware Co., its officers and contractors, to recover damages for trespassing upon its road at Pen Argyl, Pa., where there has been much trouble over a connection between the two roads.

The various pending suits in the case have been postponed, and it is said that negotiations are in progress for a compromise settlement.

Pensacola & Atlantic.—The following circular has been issued by General Ticket Agent F. B. Bonifay: "In preparing coupon tickets over the Pensacola & Atlantic Railroad, please use River Junction as the designation of this company's eastern terminus, instead of Chattahoochee."

"The village of Chattahoochee is really two miles or more distant. As it will become desirable to have a post-office at our terminus, a different name is necessary to designate it from the post office at Chattahoochee village."

"River Junction is the point where this company connects with the Florida Central & Western and the Savannah, Florida & Western, on the east bank of the Apalachicola River, two miles below the mouth of the Chattahoochee River."

Philadelphia & Reading.—The Receivers statement for December, the first month of the fiscal year, is as follows:

	1882.	Net.	1881.	Net.
Railroad Co.....	\$1,795,372	\$838,609	\$1,850,889	\$870,611
Coal & Iron Co.....	1,069,829	5,174	1,380,788	66,931
Total.....	\$2,865,201	\$843,783	\$3,231,677	\$937,542

This statement shows for the Railroad Company a decrease of \$55,517, or 3 per cent., in gross earnings, and of \$32,002, or 3.7 per cent., in net earnings; for both companies, a decrease of \$366,476, or 11.3 per cent., in gross earnings, and of \$93,759, or 10 per cent., in net earnings. The year does not open well.

The coal statement is as follows:

	1882.	1881.	Decrease.	P. c.
Tons coal on R. R.....	700,565	760,345	59,780	7.1
Tons mined:				
From Coal & Iron Co. lands.....	462,481	513,443	50,962	9.9

The decrease in coal traffic and output accounts probably for all the decrease in earnings.

Philadelphia, Wilmington & Baltimore.—A bill has been introduced in the Delaware Legislature to authorize this company to relocate and straighten its tracks at several points, and also to build branch lines not exceeding eight miles in length.

Pittsburgh, Cincinnati & St. Louis.—A dispatch from Columbus, O., Jan. 25, says: "In the Supreme Court to-day, the case of the Pittsburgh, Cincinnati & St. Louis Railway Co., et al. came up for argument on an appeal from the District Court of Franklin County. The suit was brought by the Pittsburgh, Cincinnati & St. Louis Railway Co. against the Central Ohio Railroad Co. as reorganized, and others, in which it is sought to have an order of partition made for that portion of the Central Ohio Railroad which lies between Columbus and Newark, a distance of 34 miles, and amounting in all to \$2,500,000. The road passed from the control of the Central Ohio and into the hands of the Baltimore & Ohio Railroad Co. in 1866, under a lease which has not yet expired, and is subject to renewal for a term of 20 years indefinitely. In 1868 or 1869 an arrangement was made between the Central Ohio and Steubenville & Indiana Railroad Company by which the section of road in controversy was used jointly by them. In 1864 the former company decided to the latter the one undivided half of the said section of railway. In 1863 the Steubenville & Indiana Railway Company was consolidated with the Pittsburgh, Cincinnati & St. Louis Railway Co., and thereafter and ever since the Baltimore & Ohio Railroad Company and the Pittsburgh, Cincinnati & St. Louis Railway Co. have been in possession jointly of the road. The question is: Can this section of the Central Ohio Road be sold, cutting it into parts, and leaving the stockholders in possession of but one of these parts, which is worthless without the other? The questions of law made by the record are: First, did the plaintiff through the consolidation proceedings shown succeed to the property of the Steubenville & Indiana Railroad Company? Second, if it did so succeed, did it obtain such a title to the property in question as will enable it to maintain this suit for partition thereof? Third, has it anything except interest in the road? The Court will render a decision on Tuesday of next week."

Richmond & West Point Terminal.—It is understood that the \$2,000,000 trust notes issued by this company and secured by deposit of stocks and bonds of its controlled lines, have all been taken, at 90. As the loan is for two years only, at 6 per cent. interest, it will cost the company 11 per cent. a year, which is pretty fair interest. It is understood that this loan will meet the pressing requirements of the company, and put it in a good financial condition for the present.

The last payment on the Virginia Midland stock bought from the Baltimore & Ohio Co. and others, was made Jan. 26, and the stock finally transferred. The amount of this final payment was \$600,000, and there had been some talk to the effect that Mr. Garrett would refuse to receive it or to deliver the stock. No objection was made, however, and the transfer was quietly completed.

Rochester & Pittsburgh.—The time within which the income bonds of this company could be exchanged for consolidated first-mortgage bonds has expired, and nearly all of the former bonds are reported to have been presented for exchange. The company now issues its consolidated bonds.

St. Louis & San Francisco.—In the suit of Adams & McConnell against this company the Missouri Circuit Court holds that the company, as successor to a corporation chartered by Congress, is exempt from statutory control by the state in regard to rates to be charged for transportation. The case will be appealed to the Supreme Court.

St. Paul, Minneapolis & Manitoba.—Surveys are being made for an extension of the St. Cloud & Hinckley

Branch from Hinckley, Minn., northeast, and it is said the line will be run to Superior City. It seems hardly probable, however, that the company would build another line to Lake Superior, when it already practically controls the St. Paul & Duluth road.

Sanborn, Cooperstown & Turtle Mountain.—This road has been completed from Sanborn, Dak., on the Northern Pacific, 71 miles west of Fargo, northward 15 miles, and grading is in progress to Cooperstown, 40 miles from Sanborn. Work is to be pushed as fast as the weather will permit.

Savannah & Pacific Short Line.—The officers of this company claim that they will soon begin work on their projected line from Savannah, Ga., to Columbus.

Southeastern, of Canada.—This company now operates about 360 miles of road, and owns 28 engines, 45 passenger train cars and 840 freight cars. Last year branches were built from Marietta, P. Q., to St. Cesaire, 9 miles, and from Drummondville to L'Avenir, 15 miles, besides a spur 2 miles long at Sorel to new docks which the company has built on the Richelieu River. Extensions have been begun from St. Cesaire to Sherbrooke on the International road, from L'Avenir to Richmond on the Grand Trunk, and from Stanbridge to Doucet Landing on the St. Lawrence, opposite Trois Rivières. The Montreal, Portland & Boston has been completed from West Farnham to East Franklin, and is to be extended to Sheldon, Vt., in the spring, when a branch will also be built from Chamby by St. Johns to Moores Junction on the Ogdensburg & Lake Champlain. The shops at St. Johns have been enlarged by several substantial brick buildings.

Southern Pacific.—Mr. Charles Crocker, President of this company and Vice-President of the Central Pacific, expressed himself as follows in New York last week:

"The Southern Pacific route will be opened from San Francisco to New Orleans in a few days. By the 20th we had trains running, but the route may not be thoroughly organized before Feb. 10. The relations between the Pacific roads are very harmonious. Our new route has been recognized in the pool as an important factor in the through business. I believe the percentage has been fixed, but that is a secondary matter after the formal recognition of the new route. We expect to build up a great deal of new business over the Southern Pacific. There will be a good market in the South for the fruits and wines of California. We also expect to carry a great deal of wheat to New Orleans for shipment thence to Europe. We believe that this business can be carried on successfully. There are 2,000,000 tons of grain in Southern California for export, and that of itself will make a good traffic. We will do an excellent business to New Orleans when our line is in operation. The time by the Southern route will be considerably less than by the Union Pacific from San Francisco. Naturally there will be some diversion of business from the older Pacific routes to the new line. Many tourists will take the new route for one way or both ways for the sake of variety. There is considerable complaint at present at the delays suffered by merchants in California in the receipt of their goods from New York. The trunk lines, of course, when they are pressed with business will not let their cars go beyond their western termini. We do not propose to have any of that trouble. Our cars will be put through without any waits or side-tracking. We have already had application for the transportation of negro laborers from the South to California. They are needed in the vineyards and in the cotton fields that are being opened in the Southern part of the state. Since the exclusion of Chinese immigration the demand for cheap labor in California has become serious. It looks to me as if there would be a call there that 'the Chinese must come.'"

"We are also pushing our Atlantic & Pacific branch to meet the western extension of the Atlantic & Pacific road, and the two ends will probably be connected in April or May next. That will open another through route to compete for the Pacific coast business. I fear the country is to suffer from too many railroads; there is not enough through business for all the lines that will be opened to California. Some of them will have to develop a local business if they expect to prosper."

South Pennsylvania & Ohio.—This company has filed articles of incorporation to build a railroad from Belaire, O., to Toledo, with branches from a point near Toledo to the Indiana line; from a point in Tuscarawas county to Cleveland; from Lodi to Chicago Junction on the Baltimore and Ohio, and from Norwalk to Huron. The main line proposed is almost exactly that of the Wheeling & Lake Erie road, a large part of which is now completed. The incorporators are Robert H. Cochran, J. V. W. Graham, Charles H. Jenkins, Lewis W. Sutherland and O. Russell Wood. It is variously conjectured that this may be a Baltimore & Ohio project, or an extension of the South Pennsylvania road.

Toledo, Cincinnati & St. Louis.—The new President, Mr. E. B. Phillips, has been making an inspection of the road, and submitted a report on its condition to the board. The board has authorized him to contract for 25 new locomotives for the road.

Texas & New Orleans.—This road, a controlling interest in which has been owned by the Southern Pacific for some time, has now passed directly under its management. The road will be worked hereafter as a division of the Galveston, Harrisburg & San Antonio, although a separate organization will be kept up. The road extends from Houston, Tex., to Orange, 105 miles, and is extended further to Vermillionville, La., 112 miles, by the Louisiana Western, which it leases.

Valley, of Virginia.—The grading of the extension of this road is now completed from Staunton, Va., to Greenville, and is nearly finished to Lexington. Tracklaying has been prevented by bad weather, but will be begun as soon as possible, and the contractors promise to have trains running to Lexington in June.

Western North Carolina.—A bill has been introduced in the North Carolina Legislature which, if passed, will extend by a year the time for the completion of the Ducktown Branch, and will authorize the building of several short local branches. The company has offered to buy the state's remaining interest in the road for \$600,000, payable in State bonds.

Williamsport & Clearfield.—This road is now all under contract, and the grading is to be completed by August next. It is to connect with the Philadelphia & Erie and run into the Clearfield coal region from the northward. It is understood that a traffic agreement has been made with the Pennsylvania Railroad Co., under which the new road will be worked.

Wisconsin, Iowa & Nebraska.—The grading of this road is reported nearly finished from Waterloo, Ia., southwest to Marshalltown, about 50 miles. Track laying was recently begun at Marshalltown, and five miles have been laid.